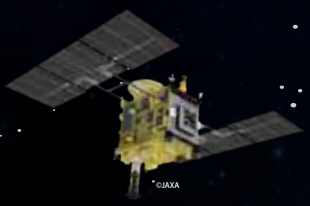
Joint Symposium

33rd ISTS & 10th NSAT & 14th IAA LCPM



ISTS : International Symposium on Space Technology and Science
NSAT : Nano-Satellite Symposium
IAA LCPM: Low-Cost Planetary Missions Conference

Feb 26 - Mar 4, 2022

Beppu, Oita, Japan

Beppu in Oita:

Beautiful Harmony of Earth and Space for Sustainable Future.

PROGRAM BOOK

Contact us:

https://www.ists.or.jp/

Joint Symposium : 33rd ISTS & 10th NSAT & 14th IAA LCPM Main Theme " Beautiful Harmony of Earth and Space for Sustainable Future."

CONTENTS

Letters of Welcome

Message from the 33rd ISTS General Chairperson

On behalf of the ISTS organizing committee, I am very pleased to welcome you to the 33rd ISTS Beppu in Oita, which is one of the most beautiful cities of Japan and very famous as "onsen (hot spa) town."

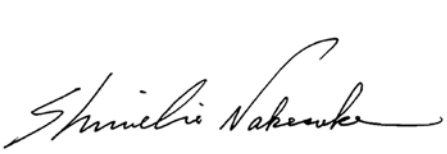
ISTS stands for "International Symposium on Space Technology and Science," which is one of top five largest international space related symposiums, covering almost all the disciplines related to space. It first met in 1959 in Tokyo and has been held in Japan almost every two years, and recent ISTS had more than 1,000 participants from all over the world. Initially, 33rd ISTS was planned to be held in June 2021, but due to COVID-19 problem, we decided to postpone it to February 2022 with a hope that face to face on-site meetings will become possible in 2022. One of the very important objectives of holding this kind of symposiums or conferences is to provide participants with excellent opportunities to discuss with other participants on technical issues, formulation of new collaboration plans and to find new friends who have common interests. Under this severe COVID-19 situations prevailing the world, it would be difficult for all the participants to attend the symposium on-site, so we organize the symposium program as "hybrid" so that participants can hear presentations and discuss with other participants online or onsite. And for the participants who can come to the symposium site, please enjoy face to face discussions with other participants to move forward your research or business, which we could not do for these years.

We, as an organizing committee of ISTS, have been recognizing the importance of collaboration and exchange with local government and community. Our success in past ISTS can be attributed not only to the combined endeavors of the participants and the organizing committees but also to the strong supports from the local communities. We are so proud to have assisted the local communities in increasing their involvement in space related activities, including space utilizations by local governments, space business and education to younger generations even before the symposiums. Also I am very grateful to Oita and Beppu local governments for their kindest provision of the main reception, special programs and cultural events, with which I would encourage you to enjoy the wonderful food, culture and "onsen" of Beppu in Oita.

"Beautiful Harmony of Earth and Space for Sustainable Future."

We picked up the above words as the main theme of 33rd ISTS. This is a very important concept which we all should continually pursue into the future. Let us make this ISTS the first step towards realizing this goal, by exchanging ideas and stimulating discussions with new and old friends to brainstorm how space technology and science can contribute to it.

I hope all of you will enjoy the symposium as well as your stay in Beppu in Oita !!



Prof. Shinichi Nakasuka,
General Chairperson of the 33rd ISTS

Message from the 10th Nano-Sat Symposium General Chairperson

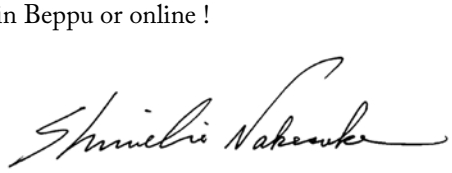
We are witnessing a big game change of space development and utilization all over the world. Small/micro/nano-satellite "mega-constellations" have appeared on the stage in various areas such as communication, Earth observation and PNT (Position, Navigation and Time) service, etc. Constellations of large number of satellite can provide high time resolution which will be important for frequent observation of the Earth for disaster detection and monitoring missions, and communication service using low altitude satellites will mitigate power requirement and also reduce the communication latency. Such large number of satellites mostly weigh less than 250kg, and even CubeSats (such as 3U or 6U) are being employed. By utilizing such benefits of LEO constellation, many venture companies are now very actively proceeding with business, and large investment to those venture companies have been made by governmental and private funds. Not only in business fields, but also in the field of space science and exploration, micro/nano-satellites are becoming to be employed, such as NASA JPL's INSPIRE(3U), MarCO(6U) for interplanetary missions and ASTERIA (6U) for exoplanets observation mission. In Japan, too, PROCYON (65kg) was launched to interplanetary trajectory in 2014, and two 6U CubeSats EQUULEUS and OMOTENASHI are to be launched to cis-lunar trajectory by NASA's new SLS rocket in 2022. Utilizations of micro/nano/pico-satellites are now not only for educational or experimental use but for real business, space science and other practical applications.

Maybe we cannot perfectly predict the future ways of utilizing these satellites, just as initial computer developers could not predict today's so varied and profound utilizations of personal computers. Key factor of such "explosion of utilizations" is extremely low cost and large availability of PCs. The same phenomenon is now happening in space, by utilizing the similar features of micro/nano/pico-satellites. Let us see what will happen with these satellites in future!

Nano-satellite symposium (NSAT) which started in 2010 has been featuring the technologies, applications, legal matters, educational aspects and many other themes related to micro/nano/pico-satellites. Though the symposium's name is "Nanosatellite Symposium," the scope has not been restricted to nano-satellites (around 10kg), but also includes micro and pico-satellites. Japanese "Hodoyoshi Project" lead by myself hosted the first five Nano-satellite Symposiums during the project period (2010-2013) in Japan, among which 5th Symposium held in University of Tokyo in 2013 found 260 attendants from 47 countries. 6th Symposium was held as one session of 30th ISTS in Kobe in 2015, 7th was in Varna, Bulgaria in 2016, 8th was in 31st ISTS Matsuyama in 2017, and 9th was held in 32nd ISTS Fukui in 2019.

As I mentioned every time, one of the important objectives of continually holding Nano-satellite Symposiums is to strengthen our community of micro/nano/pico-satellites. Through the previous nine symposiums, we have established firm community in this field, grew friendships, and several practical collaborations actually started within our community. The 10th NSAT, organized together with 33rd ISTS in Beppu, is to be held in hybrid fashion: the participants either online or on-site are encouraged to deepen old friendship, discuss technical matters and find new friends, and I would encourage on-site participants to enjoy beautiful nature, culture and excellent food and "onsen (hot spa)" of Beppu in Oita.

I welcome all of you to the 10th NSAT and let us share the current technologies and future visions of these evolving space systems. I am looking forward to seeing you in Beppu or online !



Prof. Shinichi Nakasuka,
General Chair of the 10th Nano-satellite Symposium

Message from the President of JSASS

On behalf of the Japan Society for Aeronautical and Space Sciences (JSASS), I would like to thank everyone who participated in the 33rd ISTS. Also, I am particularly pleased to be able to host the event in Beppu City, Oita Prefecture as the main venue because my hometown is Oita city next to Beppu city. The year I was born in 1961 was the year Yuri Gagarin became the first human to fly in space. And last years was the 60 years anniversary of human spaceflight and could be called "the first year of private spaceflight", with spacecraft from private companies such as Blue Origin and SpaceX successfully flew into space with passengers on board. And there will be more opportunities for ordinary people who are not astronauts to fly in space.

The COVID-19 pandemic since 2020 has taught us those global problems have no borders and that we must work together to solve them. The theme of the 33rd ISTS is "Beppu in Oita: Beautiful Harmony of Earth and Space for Sustainable Future." And I believe that Space Technology and Science can provide an effective means of solving global problems, represented by the SDGs: Sustainable Development Goals, as well as problems common to all humankind, by providing a perspective from Earth to Space and from Space to Earth.

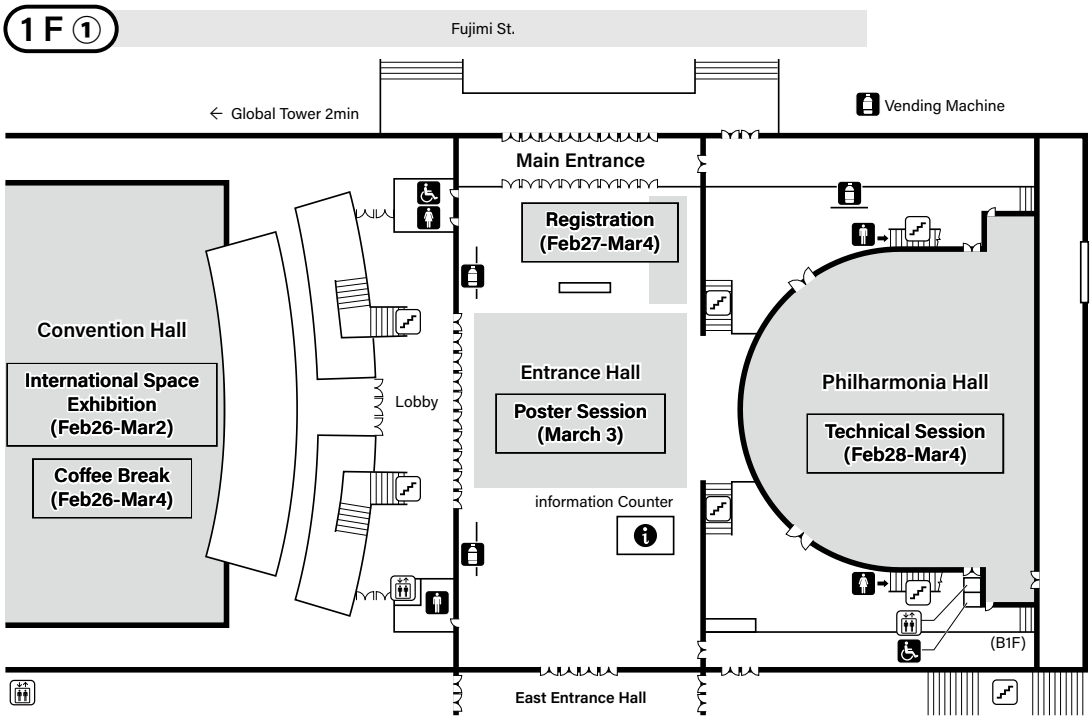
For example, Space Vision 2050 was established by JSASS as a 50-year anniversary project, since JSASS introduced "space" in addition to "aviation" to become the "Society for Aeronautical and Space Science" and advocates the construction of a lunar base in the underground cavity of the moon protected from space radiation. The Vertical Hall which is the entrance to this underground cavity was discovered by Japanese scientist from the observation data of the lunar probe KAGUYA (SELENE) and is the greatest achievement that our country's space science can contribute to the advancement of mankind into space. We would like to provide a forum where researchers of space science and space technology such as space robotics, which is necessary for future space activities, come together to conduct meaningful research presentations and discussions that will lead to the sustainable development of humankind.

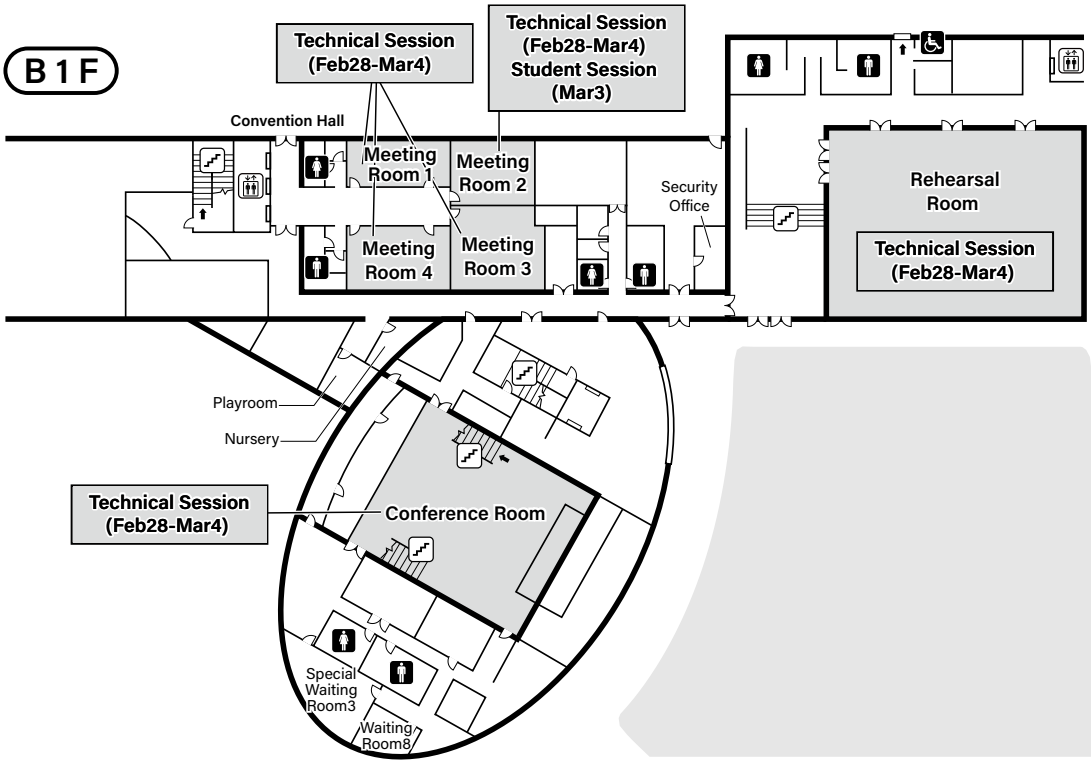
Beppu is the number one hot spring city in Japan in terms of the number of sources and the amount of spring water, and you could also enjoy sightseeing "Jigoku Meguri" in the feeling of "heaven" by soaking in hot springs. It is a beautiful place surrounded by the sea and mountains. Furthermore, Beppu is blessed with delicious seafood like Shiroshita Karei (flatfish), Seki Aji, and Seki Saba. I hope that this wonderful Beppu will be the base point for meaningful research presentations and discussions, and that it will be a useful symposium for the development of humankind.

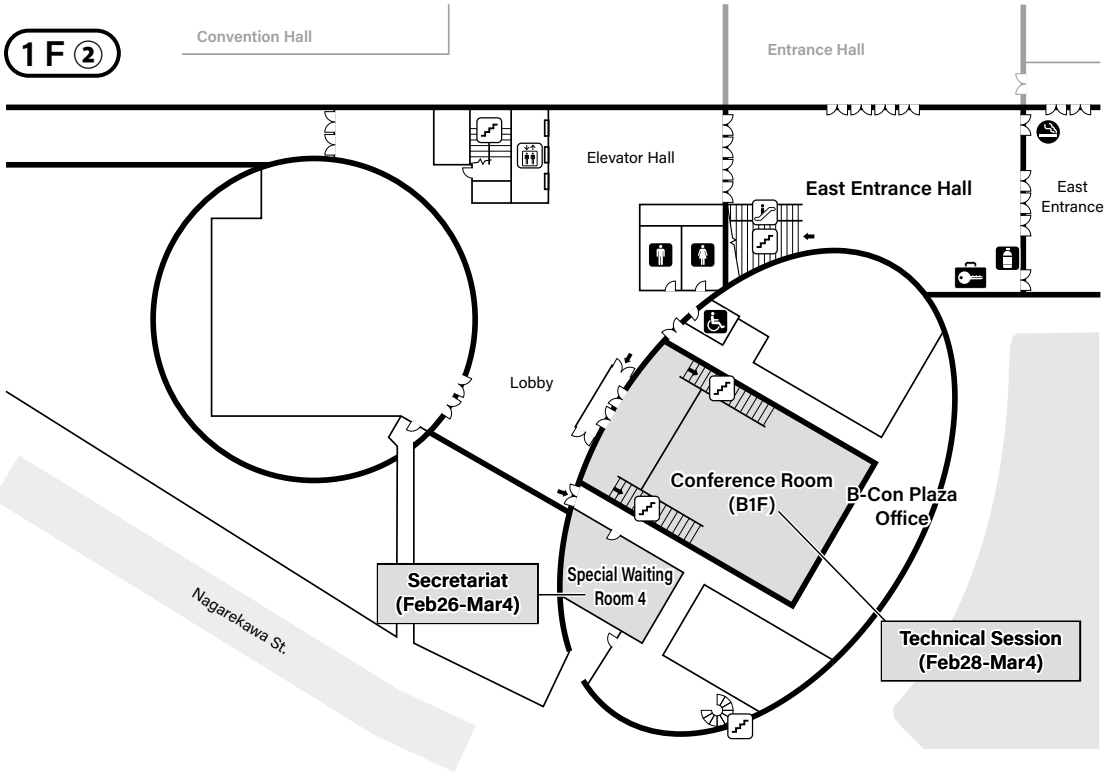
Isao Kawano

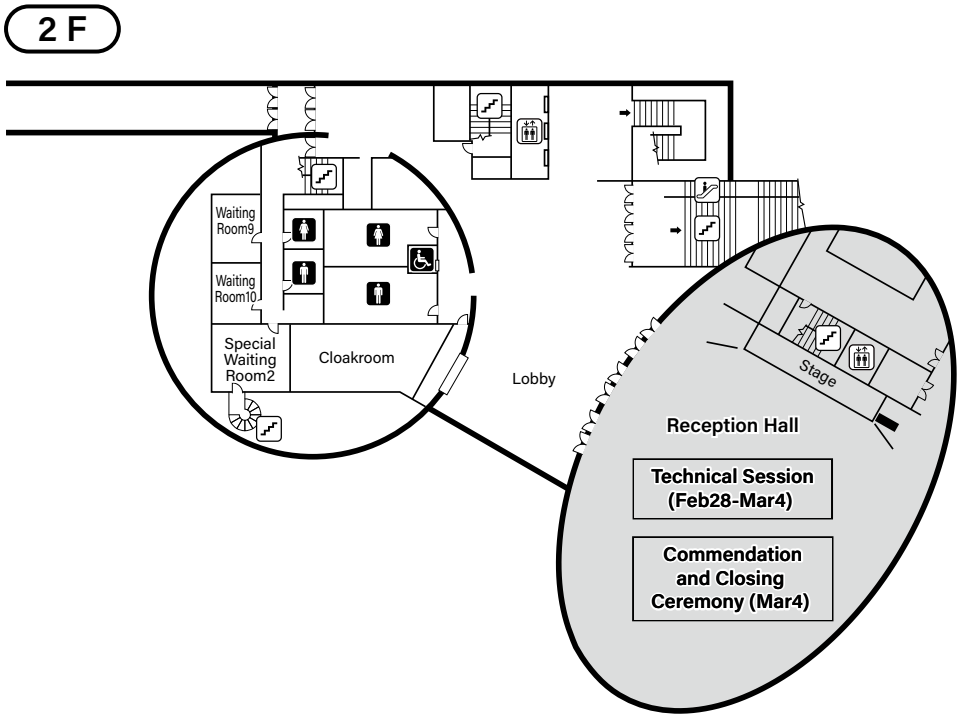
Isao KAWANO
President,
The Japan Society for Aeronautical and Space Sciences

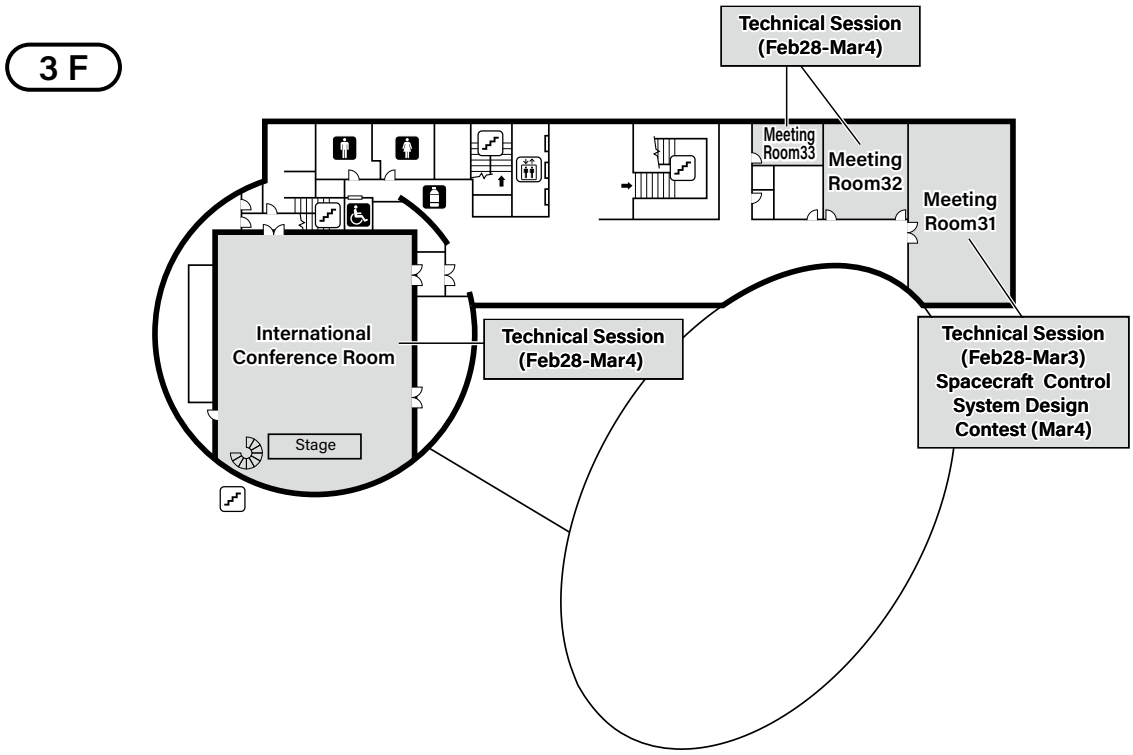
Symposium Site Floor Guide






1 F ②
Convention Hall
Entrance Hall
Elevator Hall
East Entrance Hall
East Entrance
Lobby
Conference Room (B1F)
B-Con Plaza Office
Secretariat (Feb26-Mar4)
Special Waiting Room 4
Technical Session (Feb28-Mar4)
Nagarekawa St.


2 F
Waiting Room9
Waiting Room10
Special Waiting Room2
Cloakroom
Lobby
Stage
Reception Hall
Technical Session (Feb28-Mar4)
Commendation and Closing Ceremony (Mar4)


3 F
Technical Session
(Feb28-Mar4)
Meeting
Room33
Meeting
Room32
Meeting
Room31
International
Conference Room
Technical Session
(Feb28-Mar4)
Technical Session
(Feb28-Mar3)
Spacecraft Control
System Design
Contest (Mar4)
Stage

Contacts and Open Hours

Secretariat

The 33rd ISTS Secretariat: Special Waiting Room4, 1F, B-Con Plaza
Opening Hours:

February 27 (Sun)	9:00 - 18:00
February 28 (Mon) - March 2 (Wed)	8:30 - 18:00
March 3 (Thu)	8:30 - 20:00
March 4 (Fri)	8:30 - 18:30

Reception, Registration & Information Desk

Entrance Hall, 1F, B-Con Plaza
Opening Hours:

February 27 (Sun)	14:00 - 17:00
February 28 (Mon) - March 3 (Thu)	8:30 - 18:00
March 4 (Fri)	8:30 - 16:30

International Space Exhibition

February 26 (Sat) – March 2 (Wed)
Convention Hall, B1F, B-Con Plaza
Opening Hours:

February 26 (Sat)	12:00 - 17:00
February 27 (Sun) - March 2 (Wed)	10:00 - 17:00

Wi-Fi Service

Free wireless internet access is available in the session rooms at B-Con Plaza.
B-CON_FREE
PW: bcon12341101

Program Application for PC, iPad and Mobile phones

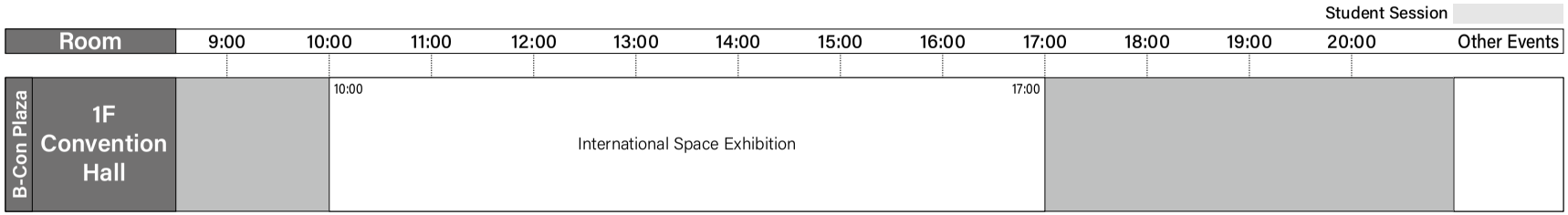
PC: Access the symposium program site (https://www.ists.or.jp/program/41/).
iOS: Search by keyword "ists2021" at the App Store and download the application.
Android: Search by keyword "ists2021" at the Google Play and download the application.
*In order to view paper PDF, personal ID and Password (sent by email after registration) are required

Time Table Overview/ Event Schedule

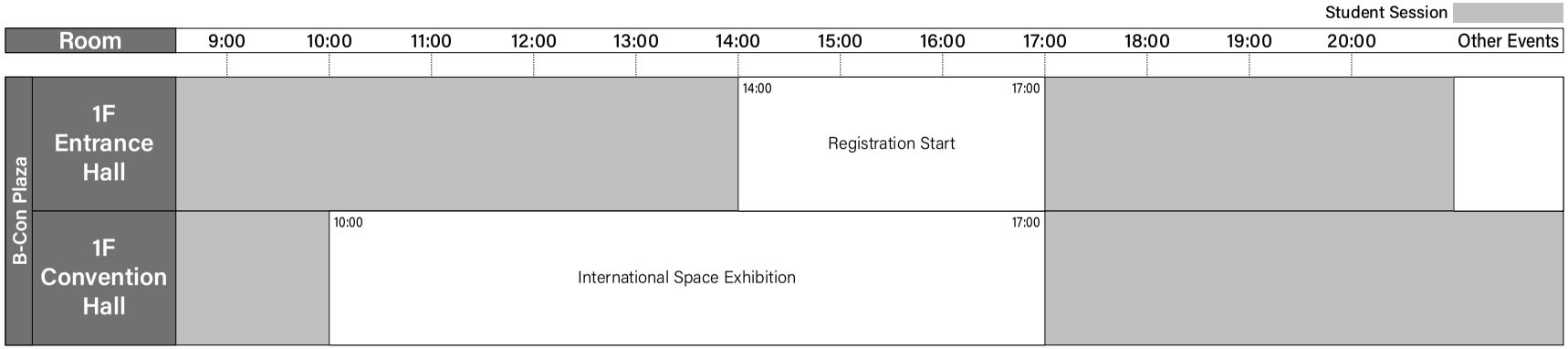
Date	Morning	Afternoon	Night	Other Activities
February 26 (Sat)	· Exhibition Opening (10:00, B1F Convention Hall)			· International Space Exhibition (10:00-17:00, B1F Convention Hall)
February 27 (Sun)		· Registration Start (14:00, 1F Entrance Hall)		· International Space Exhibition (10:00-17:00, B1F Convention Hall)
February 28 (Mon)	· Opening Ceremony (9:00-9:50, Philharmonia Hall) · Plenary Lecture (10:00-10:35, Philharmonia Hall) · Keynote Speech 1 (10:35-11:10, Philharmonia Hall) · Keynote Speech 2 (11:10-11:45, Philharmonia Hall)	· Highlight I : World Space Highlight (13:30-15:00, Philharmonia Hall)	· Welcome Reception (19:00-21:00, Hikari Hall, Suginoi Hotel)	· International Space Exhibition (10:00-17:00, B1F Convention Hall)
March 1 (Tue)	· Technical Sessions (B-Con Plaza)	· Highlight II : Creation of new spaceindustry and innovation from Kyushu (14:00-15:40, Philharmonia Hall) · Technical Sessions (B-Con Plaza)	· Cultural Night (17:00-, Kannawa Jigoku Mushi) · Cultural Night (18:00-, Kannawa Jigoku Mushi))	· International Space Exhibition (10:00-17:00, B1F Convention Hall) · Technical Tour: 1. Usa Jingu Shrine Morning Tour
March 2 (Wed)	· Technical Sessions (B-Con Plaza)	· Highlight III : Sustainable Energy (14:00-15:40, Philharmonia Hall) · Technical Sessions (B-Con Plaza)		· International Space Exhibition (10:00-17:00, B1F Convention Hall) · Technical Tour: 2. Yufuin and Beppu Half Day Tour
March 3 (Thu)	· Technical Sessions (B-Con Plaza)	· Highlight IV : Young Professionals Program, Sustainable Space Development Visions 2040 (14:00-15:40, Philharmonia Hall) · Technical Sessions (B-Con Plaza)	· Technical Session Poster (18:00-20:00 1F Entrance Hall)	· Technical Tour: 3. Usuki Stone Buddhas & Puffer-fish Lunch Tour
March 4 (Fri)	· Political and Strategic Discussions on Satellite Technologies (to be discussed in Japanese language) (9:00-10:40, Philharmonia Hall) · Political and Strategic Discussions on Future Space Transportation System (to be discussed in Japanese language) (11:00-12:40, Philharmonia Hall) · Spacecraft Control System Design Contest (9:00-12:40, Meeting Room31) · Technical Sessions (B-Con Plaza)	· Highlight V : Sustainable Habitation on Moon (14:00-15:40, Philharmonia Hall) · Technical Sessions (B-Con Plaza)	· Commendation & Closing Ceremony (18:00-19:30, 2F Reception Hall)	· Technical Tour: 4. Kunisaki Peninsula Temples & Shrines Hopping Tour

Final Program Session Schedule

February 26, Saturday 33rd ISTS Final Technical Program Overview



February 27, Sunday 33rd ISTS Final Technical Program Overview



February 28, Monday 33rd ISTS Final Technical Program Overview

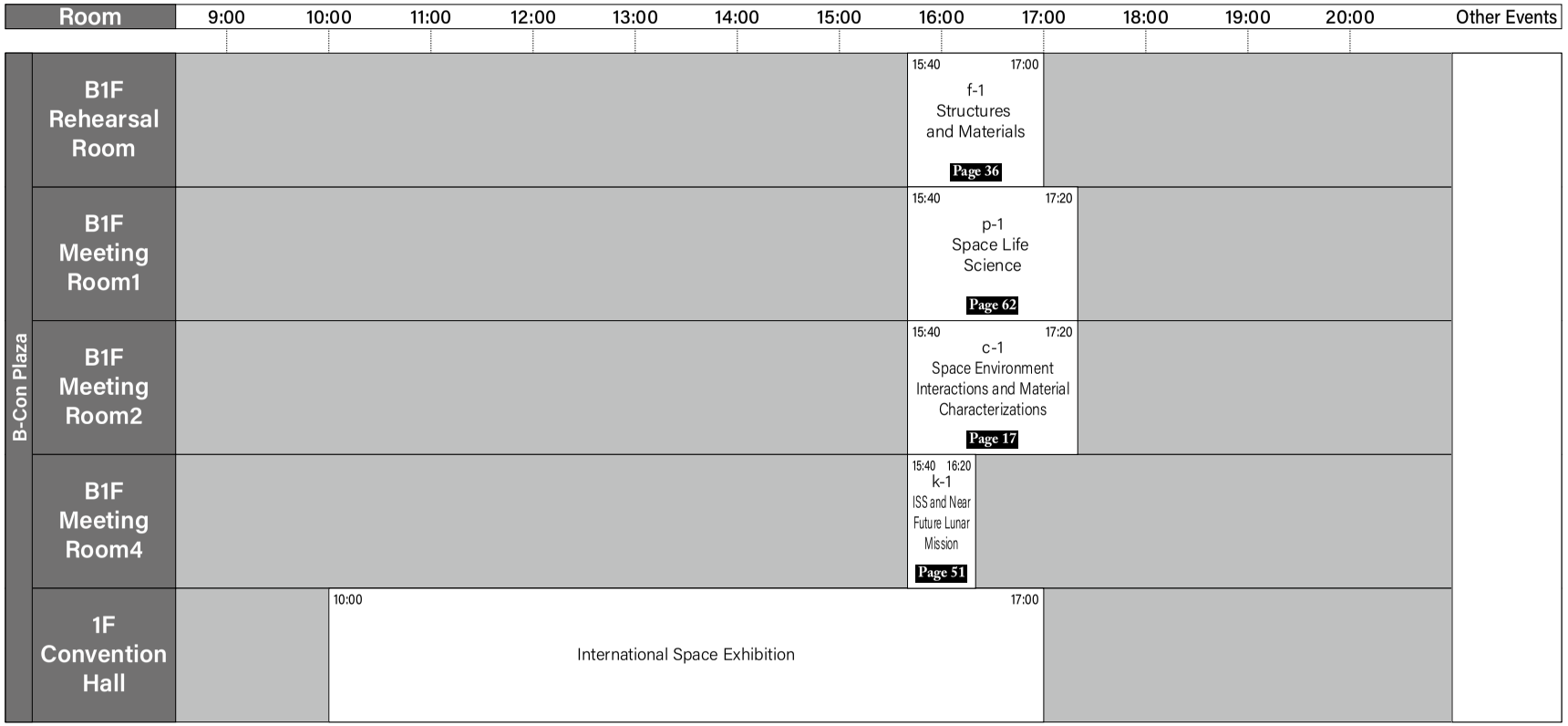
Student Session

Room	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	Other Events
B-Con Plaza													
1F Philharmonia Hall	9:00 9:50 Opening Ceremony	10:00 10:35 Plenary Lecture	10:35 11:10 Keynote Speech 1	11:10 11:45 Keynote Speech 2		13:30 15:00 Highlight I : World Space Highlight							
2F Reception Hall								15:40 17:20 b-1 Ion Thrusters / Cathodes **Page 10**					
3F International Conference Room								15:40 17:20 d-1 Orbit Determination & Control 1 **Page 21**					
3F Meeting Room31								15:40 16:20 a-1 Conceptual study & Systems study **Page 5**					
3F Meeting Room32								15:40 17:10 l-1 IAA Low-Cost Planetary Missions Conference 1 **Page 54**					
3F Meeting Room33								15:40 16:20 u-1 STEM and outreach **Page 70**					
B1F Conference Room								15:40 17:20 d-2 Attitude Determination & Control 1 **Page 22**					

Welcome Reception

Place: Hikari Hall, Suginoi Hotel

Time: 19:00-21:00

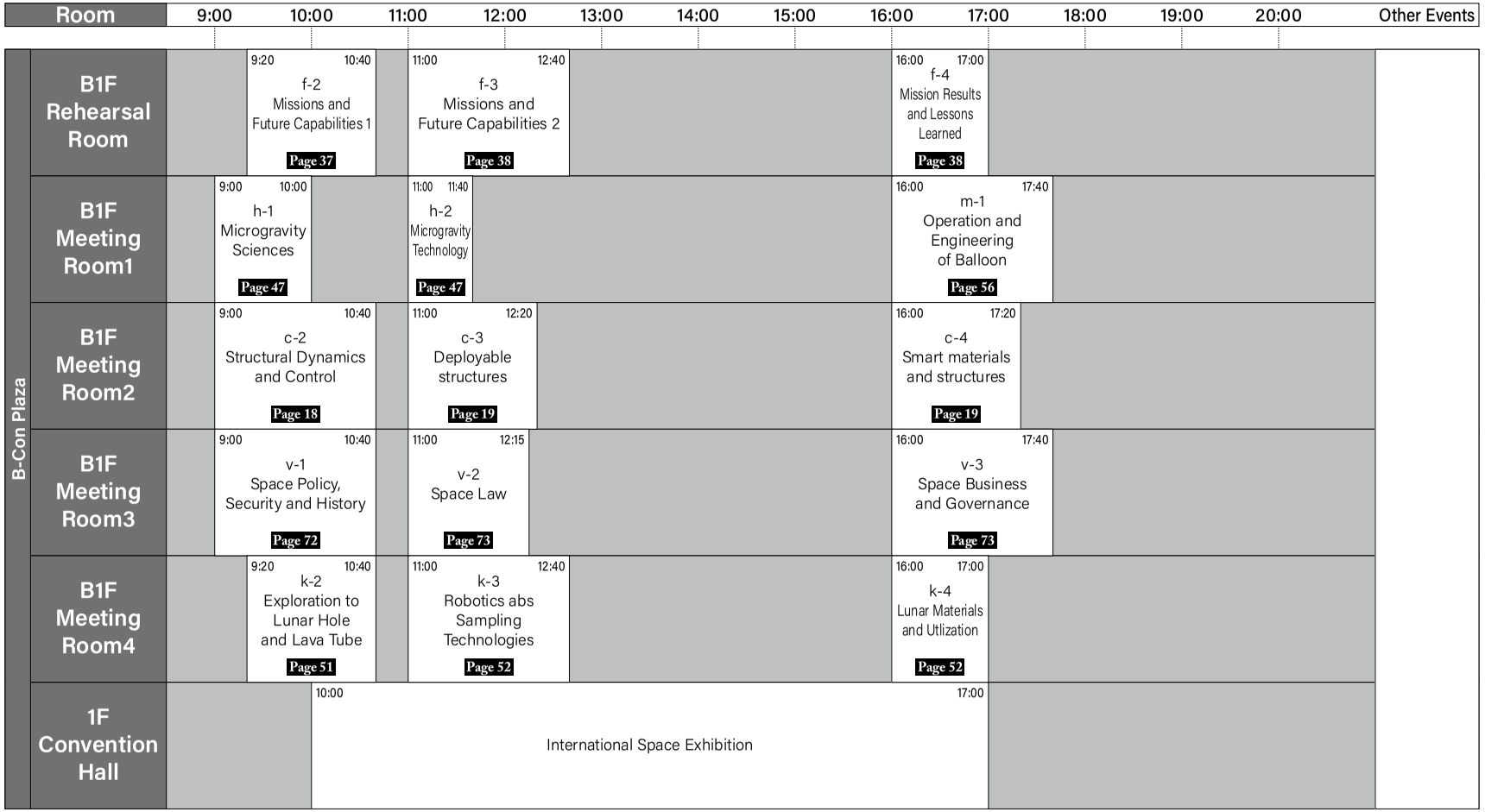

Room
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
Other Events
B-Con Plaza
B1F Rehearsal Room
15:40 17:00
f-1
Structures and Materials
Page 36
B1F Meeting Room1
15:40 17:20
p-1
Space Life Science
Page 62
B1F Meeting Room2
15:40 17:20
c-1
Space Environment Interactions and Material Characterizations
Page 17
B1F Meeting Room4
15:40 16:20
k-1
ISS and Near Future Lunar Mission
Page 51
1F Convention Hall
10:00
17:00
International Space Exhibition

March 1, Tuesday 33rd ISTS Final Technical Program Overview

Student Session

Room	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	Other Events
1F Philharmonia Hall						14:00 15:40 Highlight II : Creation of New Space Industry and Innovation from Kyushu							
2F Reception Hall	9:00 10:20 b-2 Hall Thrusters 1 Page 10		11:00 12:40 b-3 Hall Thrusters 2 Page 11					16:00 17:40 b-4 Hall Thrusters 3 Page 12					
3F International Conference Room	9:00 10:40 d-3 Orbit Determination & Control 2 Page 23		11:00 12:20 d-4 Orbital Dynamics 1 Page 24					16:00 17:20 d-5 Orbital Dynamics 2 Page 24					Cultural Night Place: Kannawa Jigoku Mushi Time: ①17:00- ②18:00-
3F Meeting Room31	9:00 10:00 a-2 Air-breathing Engine 1 Page 5		11:00 12:40 a-3 Air-breathing Engine 2 Page 6					16:00 17:40 a-4 Combustion Page 6					
3F Meeting Room32	9:00 10:00 I-2 IAA Low-Cost Planetary Missions Conference 2 Page 54		11:00 11:30 I-3 IAA Low-Cost Planetary Missions Conference 3 Page 55					16:00 16:20 I-4 IAA Low-Cost Planetary Missions Conference 4 Page 55					
3F Meeting Room33	9:00 9:40 u-2 New appoach in space education Page 70		11:00 12:00 u-3 Hands-on Education with hybrid rocket Page 71					16:00 17:20 u-4 Education with Nanosatellites Page 71					
B1F Conference Room	9:00 10:20 d-6 Attitude Determination & Control 2 Page 25		11:00 12:00 d-7 Attitude Dynamics Page 26					16:00 16:55 r-1 Space Environment Page 65					

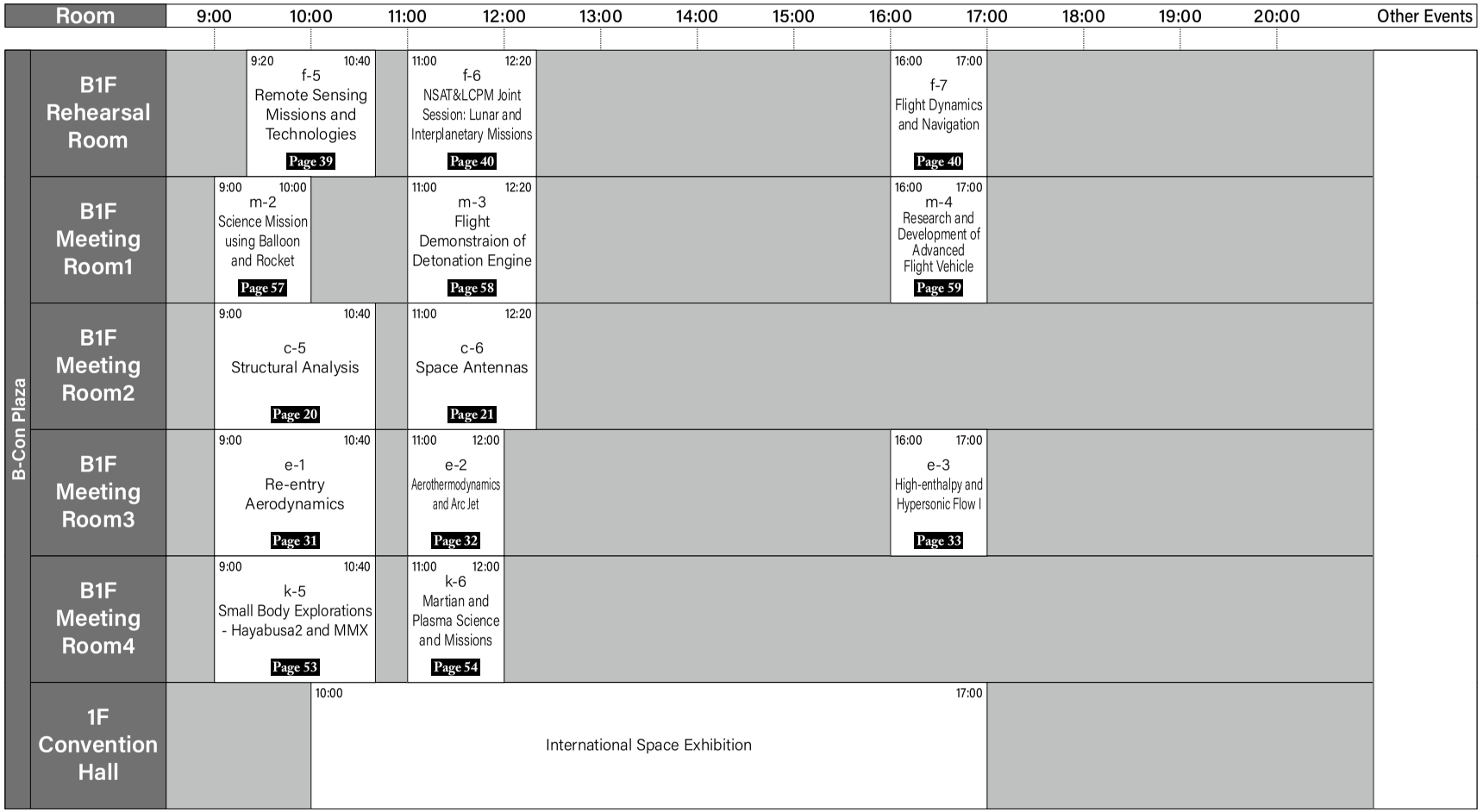
B-Con Plaza


Room
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
Other Events
B-Con Plaza
B1F Rehearsal Room
9:20 10:40 f-2 Missions and Future Capabilities 1 Page 37
11:00 12:40 f-3 Missions and Future Capabilities 2 Page 38
16:00 17:00 f-4 Mission Results and Lessons Learned Page 38
B1F Meeting Room1
9:00 10:00 h-1 Microgravity Sciences Page 47
11:00 11:40 h-2 Microgravity Technology Page 47
16:00 17:40 m-1 Operation and Engineering of Balloon Page 56
B1F Meeting Room2
9:00 10:40 c-2 Structural Dynamics and Control Page 18
11:00 12:20 c-3 Deployable structures Page 19
16:00 17:20 c-4 Smart materials and structures Page 19
B1F Meeting Room3
9:00 10:40 v-1 Space Policy, Security and History Page 72
11:00 12:15 v-2 Space Law Page 73
16:00 17:40 v-3 Space Business and Governance Page 73
B1F Meeting Room4
9:20 10:40 k-2 Exploration to Lunar Hole and Lava Tube Page 51
11:00 12:40 k-3 Robotics abs Sampling Technologies Page 52
16:00 17:00 k-4 Lunar Materials and Utlization Page 52
1F Convention Hall
10:00 17:00 International Space Exhibition

March 2, Wednesday 33rd ISTS Final Technical Program Overview

Student Session

Room	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	Other Events
B-Con Plaza													
1F Philharmonia Hall						14:00 15:40 Highlight III : Sustainable Energy							
2F Reception Hall	9:00 9:40 b-5 Arcjets / MPD Thrusters Page 13		11:00 12:20 b-6 Pulsed Plasma Thrusters / Vacuum Arc Thrusters Page 13					16:00 16:40 b-7 Electrospray Thrusters / Advanced Micro Thrusters Page 14					
3F International Conference Room	9:00 10:00 d-8 Mission Design 1 Page 26		11:00 12:00 d-9 Mission Design 2 Page 27					16:00 17:00 d-10 Navigation & Control Page 27					
3F Meeting Room31	9:00 10:20 a-5 Liquid Rocket 1 Page 7		11:00 12:20 a-6 Liquid Rocket 2 Page 8					16:00 17:20 a-7 Liquid Rocket 3 Page 8					
3F Meeting Room32	9:00 9:20 I-5 IAA Low-Cost Planetary Missions Conference 5 Page 55		11:00 11:20 I-6 IAA Low-Cost Planetary Missions Conference 6 Page 56					16:00 16:15 I-7 IAA Low-Cost Planetary Missions Conference 7 Page 56					
3F Meeting Room33	9:00 10:40 n-1 Earth Environmental Observation by Optical Imager Page 59		11:00 12:40 n-2 Satellite Precipitation Measurement and Application Page 60					16:00 17:00 n-3 Small Satellites and New Approaches Page 61					
B1F Conference Room	9:00 10:20 r-2 NEO, Space Debris Observation Page 66		11:00 12:40 r-3 Collision Avoidance, Modelling, Space Traffic Management Page 66					16:00 17:00 r-4 Space Debris Removal Page 67					


Room
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
Other Events
B-Con Plaza
B1F Rehearsal Room
9:20 10:40 f-5 Remote Sensing Missions and Technologies Page 39
11:00 12:20 f-6 NSAT&LCPM Joint Session: Lunar and Interplanetary Missions Page 40
16:00 17:00 f-7 Flight Dynamics and Navigation Page 40
B1F Meeting Room1
9:00 10:00 m-2 Science Mission using Balloon and Rocket Page 57
11:00 12:20 m-3 Flight Demonstraion of Detonation Engine Page 58
16:00 17:00 m-4 Research and Development of Advanced Flight Vehicle Page 59
B1F Meeting Room2
9:00 10:40 c-5 Structural Analysis Page 20
11:00 12:20 c-6 Space Antennas Page 21
B1F Meeting Room3
9:00 10:40 e-1 Re-entry Aerodynamics Page 31
11:00 12:00 e-2 Aerothermodynamics and Arc Jet Page 32
16:00 17:00 e-3 High-enthalpy and Hypersonic Flow I Page 33
B1F Meeting Room4
9:00 10:40 k-5 Small Body Explorations - Hayabusa2 and MMX Page 53
11:00 12:00 k-6 Martian and Plasma Science and Missions Page 54
1F Convention Hall
10:00 17:00 International Space Exhibition

March 3, Thursday 33rd ISTS Final Technical Program Overview

Student Session

Room	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	Other Events
1F Philharmonia Hall						14:00 15:40 Highlight IV : Young Professionals Program, Sustainable Space Development Visions 2040							
2F Reception Hall	9:00 10:00 b-8 RF Thrusters Page 14		11:00 12:20 b-9 RF Thrusters / Magnetic Nozzle Page 15					16:00 17:20 b-10 Fusion Rocket / Magneto Plasma Sail Page 15					
3F International Conference Room	9:00 10:00 d-11 Formation Flying & Satellite Constellations 1 Page 28		11:00 12:00 d-12 Formation Flying & Satellite Constellations 2 Page 28					16:00 17:40 d-13 Entry/Landing/ Ascent Guidance 1 Page 29					
3F Meeting Room31	9:00 10:00 a-8 Solid Rocket & Detonation Engine Page 9												
3F Meeting Room32	9:00 10:30 l-8 IAA Low-Cost Planetary Missions Conference 8 Page 56		11:00 12:30 l-9 IAA Low-Cost Planetary Missions Conference Page 56					16:00 17:40 i-1 Thermal Control 1 Page 48					
3F Meeting Room33	9:00 10:20 n-4 Land Optical Observation and Application Page 61		11:00 12:40 n-5 Synthetic Aperture Radar and Application Page 62					16:00 16:45 t-1 Satellite Data Application Page 68					
B1F Conference Room	9:00 10:20 q-1 Space Power Systems 1 Page 63		11:00 12:00 q-2 Space Power Systems 2 Page 64					16:00 17:40 q-3 Space Power Systems 3 Page 64					

B-Con Plaza

B-Con Plaza

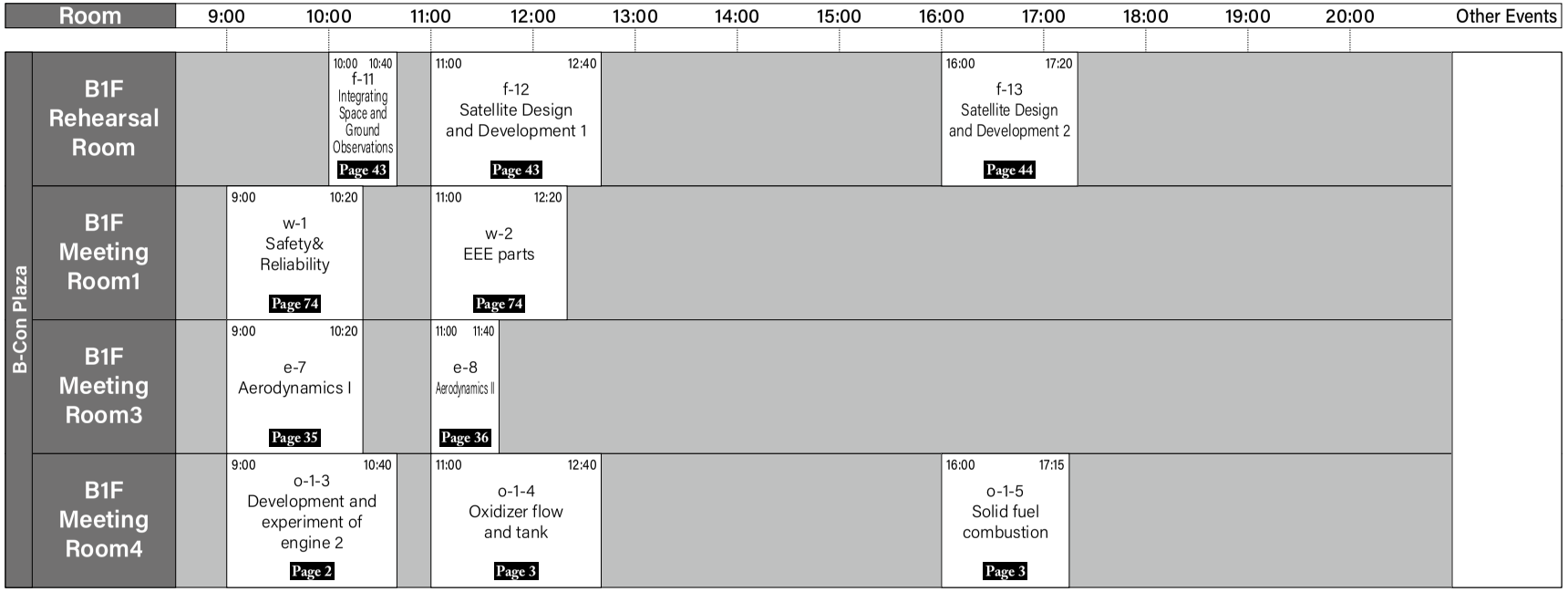
Room	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	Other Events
B1F Rehearsal Room		9:40–10:40 f-8 Formation/ Constellation Management Page 41		11:00–12:40 f-9 Attitude Determination and Control Page 41				16:00–17:40 f-10 Operations Automation and Optimization Page 42					
B1F Meeting Room1		9:00–10:00 j-1 Satellite Communications, Broadcasting and Navigation 1 Page 49		11:00–12:00 j-2 Satellite Communications, Broadcasting and Navigation 2 Page 49				16:00–17:20 j-3 Satellite Communications, Broadcasting and Navigation 3 Page 50					
B1F Meeting Room2		9:00–10:30 s-1 Finalist Student Session 1 Page 76		10:50–12:35 s-2 Finalist Student Session 2 Page 77				16:00–17:30 s-3 Finalist Student Session 3 Page 78					
B1F Meeting Room3		9:00–10:40 e-4 High-enthalpy and Hypersonic Flow II Page 33		11:00–12:40 e-5 Plasma Flows Page 34				16:00–17:40 e-6 Advanced Fluid Dynamics and Multi-phase Flow Page 35					
B1F Meeting Room4				11:00–12:20 o-1-1 Development and experiment of engine 1 Page 1				16:00–17:20 o-1-2 Numerical model and combustion instability Page 1					
F1 Entrance Hall										18:00–20:00 Poster Session Page 79			

March 4, Friday 33rd ISTS Final Technical Program Overview

Student Session

Room	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	Other Events
1F Philharmonia Hall	9:00–10:40 ss-8 Political and Strategic Discussions on Satellite Technologies (to be discussed in Japanese language) Chaired by S.Nakasuka		11:00–12:40 ss-9 Political and Strategic Discussions on Future Space Transportation System (to be discussed in Japanese language) Chaired by S.Nakasuka			14:00–15:40 Highlight V : Sustainable Habitation on Moon							
2F Reception Hall	9:00–10:20 b-11 Laser Propulsion **Page 16**		11:00–12:00 b-12 Microwave Rocket **Page 17**										
3F International Conference Room	9:00–10:20 d-14 Trajectory Design and Optimization 1 **Page 29**		11:00–12:00 d-15 Trajectory Design and Optimization 2 **Page 30**					16:00–17:20 d-16 Trajectory Design and Optimization 3 **Page 31**					Commendation & Closing Ceremony Place: Reception Hall (2F) Time: 18:00-19:30
3F Meeting Room31	9:00–12:40 ss-11 Spacecraft Control System Design Contest												
3F Meeting Room32	9:00–10:00 i-2 Thermal Control 2 **Page 48**												
3F Meeting Room33	9:00–10:15 t-2 Systems Engineering for Satellite Design **Page 68**		11:00–12:15 t-3 Model Based Systems Engineering **Page 69**										
B1F Conference Room	9:00–10:20 g-1 Reusable Launch Vehicles (RLVs) 1 **Page 45**		11:00–12:00 g-2 Reusable Launch Vehicles (RLVs) 2 **Page 45**					16:00–18:00 g-3 Reusable Launch Vehicles (RLVs) 3 **Page 46**					

B-Con Plaza


Room
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
Other Events
B-Con Plaza
B1F Rehearsal Room
10:00 10:40 f-11 Integrating Space and Ground Observations Page 43
11:00 12:40 f-12 Satellite Design and Development 1 Page 43
16:00 17:20 f-13 Satellite Design and Development 2 Page 44
B1F Meeting Room1
9:00 10:20 w-1 Safety& Reliability Page 74
11:00 12:20 w-2 EEE parts Page 74
B1F Meeting Room3
9:00 10:20 e-7 Aerodynamics I Page 35
11:00 11:40 e-8 Aerodynamics II Page 36
B1F Meeting Room4
9:00 10:40 o-1-3 Development and experiment of engine 2 Page 2
11:00 12:40 o-1-4 Oxidizer flow and tank Page 3
16:00 17:15 o-1-5 Solid fuel combustion Page 3

Special Sessions and Events

Opening Ceremony

Opening
Kojiro Suzuki (Chairperson of General Affairs Committee)

Opening Address from 33rd ISTS
Shinichi Nakasuka (General Chairperson of the 33rd ISTS)

Congratulatory address from Beppu City
Yasuhiro Nagano (Mayor of Beppu City)

Congratulatory Address from JAXA
Hiroshi Yamakawa (President of Japan Aerospace Exploration Agency)

Congratulatory Address from COSPAR
Masaki Fujimoto (Representative of Committee on Space Research)

Address from NSAT
Shinichi Nakasuka (General Chairperson of the 10th Nano-Satellite Organizing Committee)

Address from IAA:LCPM
TBD (General Chairperson of the 14th IAA:LCPM Organizing Committee)

Address from JSASS
Isao Kawano (President of Japan Society for Aeronautical and Space Sciences)

Information of Program and Event Schedule
Toru Shimada (Chairperson of Program Committee)

Closing
Kojiro Suzuki (Chairperson of General Affairs Committee)

Special Programs (Plenary, Invited Speakers)

Special Session after the Opening Ceremony

Date : February 28 (Mon.) 10:00 - 12:40
Place : Philharmonia Hall (1F)

Plenary Lecture 10:00 - 10:35
Mr. Masayasu Ishida (CEO of Spacetide, President and CEO, SPACETIDE foundation / Director, A.T. Kearney)
As co-founder, president and CEO of SPACETIDE foundation, Masayasu works on a variety of cross-industry activities with the aim of creating new waves in the space industry. Masayasu is also leading the global space group of A.T. Kearney where he has provided management consulting services to governmental agencies and space related companies in various countries. On top of that, Masayasu has been contributing to policymaking in the Japanese government through various governmental committees. He holds a degree in Mechanical Engineering from the University of Tokyo.

Keynote Speech 1 10:35 - 11:10
Mr. Mike Safyan (VP of Launch, Planet Labs PBC)
In 2011, Mike Safyan joined the eight-person founding team at Planet where the company was building the first iterations of its Dove satellite in a Cupertino garage. Mike is responsible for Planet's Launch strategy and has overseen the launch of over 350 Planet satellites across 22 launch attempts. Mike received his B.S. of Aerospace Engineering at UCLA, and an M.Sc. of Space Studies at the International Space University in Strasbourg, France. He started his career working on lunar rover designs for the Barcelona Moon Team competing for the Google Lunar X-Prize and then joined the PhoneSat team at NASA Ames where he worked as a Systems Engineer developing ultra-low-cost CubeSats utilizing smartphone technologies. In 2018, Mike received the SSPI Promise Award, which recognizes outstanding achievement by satellite industry professionals under the age of 35.

Keynote Speech 2 11:10 - 11:45
Mr. Sandy Tirtey (Commercial Launch service Director, Rocket Lab)

Highlight I : World Space Highlight

Date: February 28 (Mon.) 13:30 - 15:00
Place: Philharmonia Hall (1F)
Moderator : Yoshikazu Shoji (JAXA)

- Introduction
- National space policy and program
- Q&A and closing: Moderator

Speakers:
①USA
Mr. Garvey McIntosh , NASA
②Germany
Dr. Niklas Reinke, DLR
③France
Mr. Mariez Julien CNES
④Japan
Mr. Shoji Yoshikazu, JAXA

Highlight II : Creation of new space industry and innovation from Kyushu

Date : March 1 (Tue.) 14:00 - 15:40
Place: Philharmonia Hall (1F)
Coordinator: Yuta Kikuchi (JAXA Business Development and Industrial Relations Department)

This Highlight Session features the trends of space utilization and business creation in Kyushu that have been spreading over the past few years, with key person who are working on creating new businesses and solving social issues in Kyushu.

Speakers:
- Kyoko Dateki (Director, JAXA Business Development and Industrial Relations Department)
- Hidetaka Aoki (Space Evangelist / Director, Space Port Japan)
- Tadashi Morimitsu (Outreach coordinator, Advanced Technologies & Applications Division, Oita Prefecture)
- Ken Fujiwara (Co-founder / CEO, Umitron)
- Naohiko Kohtake (Professor, Graduate School of SDM, Keio University)

Panel Discussion follows with above speakers.
Moderator : Hidetaka Aoki

Highlight III : Sustainable Energy

Date: March 2 (Wed.) 14:00 - 15:40
Place: Philharmonia Hall (1F)
Coordinator : Oita Prefecture

Reducing greenhouse gas emissions is an urgent issue worldwide.
COP26 will be held from the end of October 2021.
The Government of Japan officially decided to reduce the greenhouse gas reduction target for 2030 by 46%, and the Cabinet decided on the basic energy plan on October 22.
Space is a part of the field that utilizes advanced technology.
How will energy be used in the future in the face of issues such as global warming, Announcement of the current status of carbon-neutral energy such as renewable energy and hydrogen, future utilization in space, including geothermal utilization in Oita Prefecture

Speakers:

- General story
  Incorporated Administrative Agency Oil and Natural Gas and Metal Mineral Resources Organization (JOGMEC)
- Kyushu Electric Power
  Kokonoe town geothermal power generation, etc.
- Shimizu Corporation (Katsu Ichikawa, Professor Emeritus, Hokkaido University)
  Biomass gasification utilizing geothermal steam, etc.
- Obayashi Corporation (planned: Green Energy Headquarters Nagao)
  Hydrogen generation (water electrolysis) using geothermal power generation

Highlight IV : Young Professionals Program, Sustainable Space Development Visions 2040

Date: March 3 (Thu.) 14:00 - 15:40
Place : Philharmonia Hall (1F)
Moderator : Naoya Ozaki (JAXA)

In the 2020s, space activities will reach a turning point due to the rapid growth of the commercial space sector and the development of new infrastructures such as lunar orbital gateways and space transportation systems. In the future, it will be necessary to think about space development visions involving not only national government organizations and academic institutions but also with private companies. In addition, "sustainability" is an indispensable keyword for future space development visions. Sustainability here includes not only environmental sustainability, such as debris management and planetary protection, but also economic sustainability, allowing space development without dependence on governmental budgets. Therefore, the ISTS will hold a program in which students and young professionals from the industry, the academia, and the government can work together on the building blocks of sustainable space development visions for 2040. Through this activity, we aim to create a team that can not only draw cross-sectional visions, but also break through the vertical divisions of occupations and elds, to solve problems as one.
Background and Purpose Activities
Six teams (about six members each) will be formed to discuss sustainable space visions. Each team will discuss "themes to be solved for 2040" and present and discuss their vision for solving the issues.

Highlight V : Sustainable Habitation on Moon

Date : March4 (Fri.) 14:00 - 15:40
Place : Philharmonia Hall (1F)
Moderator : Yuko Inatomi (JAXA)

In recent years, space agencies and private companies have been aiming to land on and explore the Moon. A key theme is to expand human activities into space and ultimately build a sustainable society on the Moon and planets. To realize this major theme, it is necessary not only to solve the pressing issues in scientific research and technological development, but also to discuss how to dramatically expand human activities beyond the existing framework, achievements, and methods of space development. This session aims to discuss the issues and solutions for sustainable human habitation of the Moon, not limited to space science.

Speakers:

- Space Radiation Measurement and Protection toward International Space Exploration
  Aiko Nagamatsu (Research and Development Directorate, JAXA)

- Sustainable Lunar Base Design by using Eco-Engineering
  Masato Sakurai (Research and Development Directorate, JAXA)

- Core Biome Complex and its Space Exploration
  Yosuke Alexandre Yamashiki (SIC Human Spaceology Center, GSAIS, Kyoto University)

- Relevance of Protein Nutrition on the Moon
  Takeshi Nikawa (Institute of Space Nutrition, Tokushima University Graduate School)

- An Overview of the Industrial Activities on Moon and Cis-Lunar Development
  Atsushi Uchida (Mitsubishi Research Institute, Inc.)

Corporate Presentation * luncheons

Date: March 1 (Tue.) 12:50 - 13:50 Mitsui Bussan Aerospace Co.Ltd.
March 2 (Wed.) 12:50 - 13:50 Space BD
Place : Meeting Room 31(3F)

The recruitment consultant corner will be set up on the 1st floor foyer, Please come if you are interested !

Social Program

Welcome Reception

Date : February 28 (Mon.) 19:00 - 21:00
Place : Hikari Hall, Suginoi Hotel
Fee : Free

On Monday evening, all ISTS/NSAT participants will be cordially invited to the Welcome Reception by the Governor of Oita Prefecture and the Mayer of Beppu City with Japanese hospitality.

Commendation & Closing Ceremony

Date : March 4 (Fri.) 18:00 - 19:30
Place : B-con Plaza, Reception Hall

The 33rd ISTS and 10th NSAT, 14th LCPM Organizing Committee intends to make this last evening of the joint symposium an unforgettable event.

Cultural Night: "Jigoku Mushi Kobo"

Date : March 1 (Tue.)
①17:00 - (Up to 30 people) ②18:00 - (Up to 30 people)
Place : Jigoku Mushi Kobo Kannawa
Fee : Free
(*)You can share the "Jigoku Mushi dish" with 3 people

At Kannawa-onsen Hot Spring in Beppu City, Oita Prefecture, "Jigoku Mushi Cuisine" using steam from hot springs, which is geothermal energy, has been popular since the Edo period.
The Jigoku Mushi Kobo is a facility where you can experience the traditional cooking method "Jigoku Mushi Cuisine" by steaming meat and vegetables in a steamer and eating them as they are after cooking. In addition, many people are surprised at its delicious taste. The 100% natural steam heat from the hot spring is used to steam the ingredients of the hot spring at a high temperature so the flavors of the ingredients are condensed and seasonal vegetables and local fresh ingredients can be cooked deliciously.
There is also a cooling equipment monument, a drinking fountain, and a corner where you can learn about the history of iron rings and hot springs. You can experience the history and culture unique to Beppu and iron rings. In addition, there is a foot-steam bath and a wheelchair accessible footbath in the next pocket park so you can enjoy delicious food and relieve your travel fatigue. " (Cre: Premium Stay Kyushu)"

Excursion

1. Usa Jingu Shrine Morning Tour

Date : March 1 (Tue.)
Tour fee : 1,100JPY

- Usa Jingu Shrine

The head shine of over four thousands of shrines across Japan that are dedicated to Hachiman, the God of Archery and War, famous as economic fortune, victory, wishing power spot.

- Kitsuki castle town

Suyanosaka slope: Vinegar shop's slope from Edo-era, traditional and unique scenery. Ryukyu and Toriten the set of local lunch unique to Oita Prefecture

2. Yufuin and Beppu Half Day Tour

Date : March 2 (Wed.)
Tour fee : 2,600JPY

- Yufuin

A leisurely walk in a world of fairy tales, Yunotsubo Street and Kinrin-ko Lake.

- Umijigoku

The iconic Beppu hot-spring, "Umijigoku" and authentic local cuisine,"Jigoku-mushi" (hot-spring-steamed dish)

3. Usuki Stone Buddhas & Puffer-fish Lunch Tour

Date : March 3 (Thu.)
Tour fee : 4,950JPY

Usuki Buddhas: Visit the great Buddhas of Usuki.
Lunch: Taste the local specialty, puffer fish lunch set.
Usuki Castle Town: Take a walk through the traditional castle town and enjoy the history of Usuki.

4. Kunisaki Peninsula Temples & Shrines Hopping Tour

Date : March 4 (Fri.)
Tour fee : 4,000JPY

Monjyusenji: Unique gomadaki ceremony
Lunch: Japanese Buddhist cuisine
Fukiji Temple: One of the oldest wooden buildings remaining in Japan.
Kumano Magaibutsu Buddha statue: The long ancient steps known to be built by ogres.

Session Details

Synopsis

The 33rd International Symposium on Space Technology and Science (ISTS) will be held at B-Con Plaza from Feb.26 (Sat) - Mar.4 (Fri), 2022.
The ISTS Organizing Committee and the Japan Society for Aeronautical and Space Sciences (JSASS) would like to invite individuals of all nations interested in space-related activities to participate in this event.

The 33rd ISTS will be held under the main theme of "Beppu in Oita: Beautiful Harmony of Earth and Space for Sustainable Future"

Beppu in Oita Prefecture is located in the Kyushu region of Japan, and boasts the number one source of hot springs and the largest amount of spring water in Japan. Beppu is considered a paradise hot springs famous for its high therapeutic effects, and it is a tourist city visited by more than 8 million tourists every year. In April 2020, Oita Airport (Kunisaki City) was selected for the first time in Asia as a space port for small satellite launch.

We will welcome you with a variety of programs, including keynote speeches, World-Space Highlights, special lectures, and poster sessions in plenary format and, in parallel format, general and organized technical sessions, student sessions, as well as a control contest, Gemstone project of young people and social programs to help you experience and enjoy Beppu.

We are looking forward to seeing you at the 33rd ISTS, 10th NSAT and 14th LCPM in the beautiful city of Beppu, with a lot of great Japanese Onsen (natural hot springs), many recreational facilities and local cuisine and crafts.

Venue

Beppu is the city of Oita Prefecture which is in the island of Kyushu, one of the four major islands of Japan, and about 100-minute flight from Tokyo. Beppu is the second largest city on Oita with a population of over 110,000 and is surrounded by Beppu Bay and the volcanic belt. Blessed with more than 2,000 hot springs, the climate of the city is mild with an average annual temperature of 15.8°C, and you can enjoy fresh farm and marine food from the nature around.
Beppu also possesses a unique culture and atmosphere. A city rich in nature and culture, overflowing with the energy of the Earth. The ISTS Conference in Beppu, to be held in 2022, will offer excellent opportunities to discuss the exploration in Beautiful Harmony of Earth and Space. People in Beppu will warmly welcome you all in hope of deepening our understanding about Space just like the hospitable waters of Beppu's abundant hot springs.
We sincerely hope that all those participating in ISTS will truly enjoy their time in the city of Beppu Oita.

Sessions

The Symposium will address various fields of space-related technology and science. It will include Special Programs, Organized Sessions, Panel Discussions, and 20 Technical Sessions of contributed papers and a Student Session.

Special Sessions after the Opening Ceremony (February 28 - March 4 2022)

- Plenary Lecture by Mr. Masayasu Ishida (CEO of Spacetide, President and CEO, SPACETIDE foundation / Director, A.T. Kearney)
- Keynote Speech 1 by Mr. Mike Safyan (VP of Launch, Planet Labs PBC)
- Keynote Speech 2 by Mr. Sandy Tirtey (Commercial Launch service Director, Rocket Lab)
- Highlight I : World Space Highlight
- Highlight II : Creation of new space industry and innovation from Kyushu
- Highlight III : Sustainable Energy
- Highlight IV : Young Professionals Program, Sustainable Space Development Visions 2040
- Highlight V : Sustainable Habitation on Moon

Organized Sessions

- **os-1 : Hybrid Rocket ~ Essentially Non-Explosive Propulsion for Future Fail-Safe Space Transportation Systems ~**

Technical Sessions

Technical Sessions will be categorized into the following 20 areas. The key words for each Technical Session are as follows:

a) Chemical Propulsion and Air-breathing Engines:
Solid, Liquid, Hybrid Rockets, Air-breathing Engines, Reusable Rockets

b) Electric and Advanced Propulsion:
Electric Propulsion, Laser/Microwave Propulsion, Solar-thermal/Sailing Propulsion, Electrodynamics Tether, Nuclear Propulsion, Magneto-hydrodynamics, Microthrusters, Thrust-er Plume and Spacecraft Interactions, Plasma Technologies, Non-propulsive Applications, Powered Flight Mission

c) Materials and Structures:
Structures of Spacecraft and Space Vehicles, Structural Dynamics and Control, Structural Analysis, Tests and Nondestructive Inspections, Material Characterizations, New-materials, Smart materials and structures, Composite materials, Space Environment Interactions, Composite Materials

d) Astrodynamics, Navigation Guidance and Control
Attitude Dynamics, Attitude Determination & Control, Attitude & Payload Sensor Calibration, Orbital Dynamics, Orbit Determination & Control, Trajectory Design and Optimization, Mission Design, Spacecraft Navigation, Entry/Landing/Ascent Guidance, Navigation & Control, Orbital Rendezvous & Proximity Operations, Formation Flying & Satellite Constellations, Space Robotics & Rover, Spacecraft Autonomy & Intelligence, Guidance, Navigation & Control Components, Recent Experiences & Lessons Learned

e) Fluid Dynamics and Aerothermodynamics
High Enthalpy Flow, Atmospheric-entry, Aero-thermodynamics, Aerodynamic Design, Rarefied Gas, Radiation, Thermal Protection System, Plasma, Magneto-gasdynamics, Low Speed Aerodynamics, Aerodynamics at Takeoff and Landing, Supersonic and Hypersonic Flow, Gas Dynamics, Wind Tunnel

f) Small Satellite : Joint session with NSAT
Innovative Small Satellite Mission, Small Satellite Utilization, Small Satellite Design and Development, Advanced Small Satellite Technology, Small Satellite Lessons Learned, Small Satellite Launch
Note : Same as the previous 32nd ISTS in 2019, papers presented at the session of f) Small Satellite are automatically registered as the technical papers of the Nano-Satellite Symposium at the same time.

g) Space Transportation

Reusable Launch Vehicles (RLVs), Expendable Launch Vehicles (ELVs), Reentry Vehicles, Orbital Transfer Vehicles (OTVs), Human Space Transportation, Sub-orbital Space Transportation

h) Micro-gravity Sciences and Technology

Micro-gravity Science, Physical Science, Fluid Physics, Combustion Science, Fundamental Physics, Material Science, Micro-gravity Experiments, Facilities for Micro-gravity Experiments, Opportunities for Micro-gravity Experiments, Operation and Utilization of the IS

i) Thermal Control

Thermal and Environmental Control, System and Instrument Thermal Design, Thermal Management, Heat Transfer, Thermophysical Property, Thermal Testing and Analysis, Passive and Active Thermal Control, Technologies, Two-phase Technology, Advanced Thermal Control Materials

j) Satellite Communications, Broadcasting and Navigation

Satellite System Architectures, Networks and Protocols, Experimental Projects and Results, Subsystems, Components and Devices, Propagation, Regulation, Financing and Marketing, Space Navigation Systems, Fixed and Broadcast Satellite Systems, Mobile Satellite Systems

k) Science and Technology for Human and Robotic Space Exploration

Scientific Objectives, Results, and Instruments for Exploration of the Moon, Planets and Solar System Small Bodies; Mission Analysis, Mission Design and Key Technologies of Human and Robotic Explorations; Commercial and Private Initiatives of Space Explorations; Road-map and Strategies for National and International Space Exploration Programs

L) IAA Low-Cost Planetary Missions: Joint session with The 14th IAA Low-Cost Planetary Mission Conference:

Agency Programs for Low-Cost Planetary Missions, Science and Engineering Results from Past and On-Going Missions, Low-Cost Planetary Missions Under Development, Science Instruments and Enabling Technologies for Future Low-Cost Planetary Exploration, Advanced Concepts for Future Low-Cost Planetary Missions by Small Sats, Cube-Sats, Nano-Sats, Rovers

m) Sounding Rocket, Balloon and Flight Experiment using Small Flight Vehicle

Promotion of Sounding Rocket or Balloon Programs , Suborbital, Scientific Results, Range Facility & Operation , Engineering Demonstration, Upper Atmosphere, Ionosphere, Flight Experiment using Small Flight Vehicle, Instrumentation, Parabolic Flights Test

n) Earth Observation

Earth Observation, Earth Environment, Remote Sensing, Remote Sensing Sensors, Application of Remote Sensing, Data and Signal Processing, Data Analysis, Ground System, Data Assimilation, Global Change Prediction, Earth System Science, Disaster Monitoring, Geographic Information Systems

p) Space Life Science

Space Medicine and Physiology, Countermeasures, Metabolism, Neurophysiology, Environmental Medicine, Behavior and Performance, Psycho-social Issue, Mental Health Care, Remote Medical Care and Tele-medicine, Biomedical Technology, Space Radiation (Measurement, Biological effect, Protection), Space Biology, Gravitational, Physiology and Biology, Artificial Gravity, Analogue Environments and Simulations, Public Outreach and Education in Life Science, Space Life Science for Human Exploration, Space Habitat

q) Space Power Systems

Solar Power Satellite, Solar Cells, Power Resources, Power Management and Distribution, Power Storage System, Wireless Power Transmission

r) Space Environment and Debris

Space Environment, Space Debris, Meteoroid, Space Situational Awareness, Debris Observation and Measurement, Debris Population and Evolution Model, Debris Risk Assessment and Management, Orbital Dynamics on Debris, Reentry Safety, Hypervelocity Impact, Protection Design, Debris Mitigation, Debris Removal, Debris Environment Remediation, Space Weather, Space Weather Forecast, Spacecraft Charging, Environment Model, Solar and Geomagnetic Activity, Environment Data Management, International Cooperation on Debris and Space Environment, Near Earth Objects, Space Traffic Management

t) Systems Engineering and Information Technology

Systems Engineering – Methodologies, Systems Engineering – System Design, Systems Engineering – Process and Tools, Model Based Systems Engineering, Verification and Validation, IT Application for Systems Engineering, Project Management and Systems Engineering, Risk Management, Software Engineering, Requirement Engineering, Knowledge Management

u) Space Education and Outreach for the Benefit of All People

Space Education, Public Outreach, Public Relations, Capacity Building, Citizen Science, International Collaborative Projects, Students Activity, Space Tourism, Effect of Space Activities on Culture and Humanity, Journalism, Art, Space Events, NanoSat and CanSat for Education, Model Rocket, Amateur Radio Satellite

v) Space Law, Policy and History

International Space Law, Domestic Law & Regulations over Space Activities, Foreign & Domestic Space Policy, Space History, Legal History, Policy History, History of Science & Technology, Industrial History, Humanities & Social Sciences, Space Business, Commercialization, Space Resource Exploitation, Environmental Protection, Space Debris, Space Diplomacy, Space Security, Disarmament & Arms Control, International Cooperation (Bilateral, Multilateral, Regional & Global), etc.

w) Safety and Mission Assurance

Safety, Reliability, Quality, Software Product Assurance, EEE & Mechanical Parts, Standardization

Organized Session

Technical Session Oral

Finalist Student Session

Technical Session Poster

Organized Session

Session o-1-1) Mar 3 (Thu) 11:00 - 12:20 [Meeting Room4]

Development and experiment of engine 1

Chairpersons: Harunori Nagata (Hokkaido University)
Koki Kitagawa (Kyushu Institute of Technology)

2022-o-1-01 (11:00 - 11:20)

Control Methods for Electrically Driven Pump-Fed Hybrid Rocket Motor

*Tadayoshi Shoyama, Masaya Kimura, Shuichi Tanabe, Yutaka Wada, Takafumi Matsui
Chiba Institute of Technology, Planetary Exploration Research Center

2022-o-1-02 (11:20 - 11:40)

Hybrid Rocket Kick Motor Engineering Model Development

*Landon Thomas Kamps, Shota Hirai, Harunori Nagata
Hokkaido University

2022-o-1-03 (11:40 - 12:00)

A Study on Hybrid Rocket Engine with Multi-Section Swirl Injection Method and Aft Counter-Swirl Injection Method with Application to Fully Reusable Launch Vehicles

*Shigeru Aso, Ryutaro Sakamoto, Seiya Hodokami, Rikiya Mifune, Masayuki Katayama
Kurume Institute of Technology Department of Traffic & Mechanical Engineering

2022-o-1-05 (12:00 - 12:20)

Rocket Sled System Design for Various Missions

*Daisuke Nakata, Kazuki Yasuda, Akihiro Watanabe, Ang YiYong, Koki Yamagishi, Tatsuhiko Shiina, Takuya Tada, Iori Obara, Yuma Hashimoto, Hikaru Eguchi, Masaharu Uchiumi
Muroran Institute of Technology

Session o-1-2) Mar 3 (Thu) 16:00 - 17:20 [Meeting Room4]

Numerical model and combustion instability

Chairpersons: Ichiro Nakagawa (Tokai University)
Yo Kawabata (Fukuoka University)

2022-o-1-07 (16:00 - 16:20)

Numerical Estimation of Discharge Coefficient of Nitrous Oxide Flow inside an Injector for Hybrid Rocket Engine

*Rikio Watanabe[1], Yoshiki Shimizu[1], Kazuki Yasuda[2], Daisuke Nakata[2]
[1]Tokyo City University, Department of Mech. Sys. Engr., [2]Muroran Institute of Technology, Aerospace Plane Research Center

2022-o-1-08 (16:20 - 16:40)

Vortex Shedding and Thermoacoustic Instability in Hybrid Rocket Combustion

*Wonjeong Hyun, Changjin Lee
Konkuk university, Department of Aerospace engineering

2022-o-1-09 (16:40 - 17:00)

Comprehensive Acoustic Modeling for Ballistic Data Reconstruction in Hybrid Rockets

*Maxime Marian Hadrien Sicat[1,2], Toru Shimada[2], Carmine Carmicino[3]

[1]The University of Tokyo, department of Aeronautics and Astronautics, [2]JAXA Institute of Space and Astronautical Science, [3]Universita di Napoli "Federico II"

2022-o-1-11 (17:00 - 17:20)

Modeling of Hybrid Rocket Combustion Using Variable Wall Temperature Model

*Takakazu Morita[1], Yansheng Yang[2], Jungpyo Lee[3]

[1]Tokai Univ. Department of Aeronautics and Astronautics, [2]Tokai Univ. Graduate School of Engineering , [3]Univ. of Brasília

Session o-1-3) Mar 4 (Fri) 9:00 - 10:40 [Meeting Room4]

Development and experiment of engine 2

Chairpersons: Shigeru Aso (Kurume Institute of Technology)
Daisuke Nakata (Muroran Institute of Technology)

2022-o-1-12 (9:00 - 9:20)

Performance Evaluation of Swirling-Oxidizer-Flow-Type Hybrid Rocket Engine using Low Viscosity Low-Melting-Point Thermoplastic Fuel

*Tsuyoshi Oishi[1], Takashi Sakurai[2]

[1]Graduate School of Systems Design, Tokyo Metropolitan University, [2]Tokyo Metropolitan University

2022-o-1-13 (9:20 - 9:40)

Design of High-Expansion-Ratio Bell Nozzle for Vacuum Conditions

*Yamato Itoigawa[1], Shota Hirai[2], Landon Kamps[2], Harunori Nagata[2]

[1]Hokkaido Univ. Department of Mechanical and Intelligent System Engineering, [2]Hokkaido Univ. Faculty of Engineering

2022-o-1-14 (9:40 - 10:00)

Experimental Study on Effect of Swirling Oxidizer Flow on Average and Local Regression Rate of Low-Melting-Point Thermoplastic Fuel for Hybrid Rockets

*Yo Kawabata[1], Yutaka Wada[2], Nobuji Kato[3], Keiichi Hori[4]

[1]Fukuoka Univ. Department of Mechanical Engineering,
[2]Chiba Institute of Technology, Department of Innovative Mechanical and Electronic Engineering, [3]Katazen Corporation, [4]JAXA

2022-o-1-15 (10:00 - 10:20)

Combustion Characteristics of Rocket Reignition System Using Radiant Heat

*Shota Hirai, Shota Inoue, Mai Fukada, Landon Kamps, Harunori Nagata

Hokkaido University

2022-o-1-16 (10:20 - 10:40)

Experimental Study on Reaction Rate of Magnesium Wire in Water Vapor Flow

*Mariko Akiyama[1], Hiroyuki Koizumi[2], Kimiya Komurasaki[1]

[1]Department of Aeronautics and Astronautics, The University of Tokyo, [2]Department of Advanced Energy, The University of Tokyo

Session o-1-4) Mar 4 (Fri) 11:00 - 12:40 [Meeting Room4]

Oxidizer flow and tank

Chairpersons: Yutaka Wada (Chiba institute of technology)
Kenichi Takahashi (Nihon University)

2022-o-1-17 (11:00 - 11:20)

Unsteady Heat Transfer Analysis and Experimental Evaluation of LOX Regenerative-cooling Nozzle for SOFT Hybrid Rocket Engines

*Hitomi Ozaki, Kodai Kurachi, Takashi Sakurai

Tokyo Metropolitan University

2022-o-1-18 (11:20 - 11:40)

Experimental Study on Filling and Discharging Characteristics of Nitrous Oxide to Spacecraft Tanks

*Kazuki Yasuda, Tatsuhiko Shiina, Daisuke Nakata, Masaharu Uchiumi

Muroran institute of technology

2022-o-1-19 (11:40 - 12:00)

Development of a LOX Vaporizer for an Altering-Intensity Swirling Oxidizer Flow Type Hybrid Rocket

*Kotoha Watanabe[1], Ichiro Nakagawa[2]

[1]Tokai Univ. Department of Mechanical Engineering School of Engineering, [2]Tokai Univ. Department of Aeronautics and Astronautics

2022-o-1-20 (12:00 - 12:20)

The VTVL Control Performance of HRE with Pressure Drop in Oxidizer Tank

*Donghoon Chae, Changjin Lee

Department of Aerospace Engineering, Konkuk University

2022-o-1-21 (12:20 - 12:40)

Evaluation of Heat Transfer Characteristics of Liquid Oxygen Flow in a Thin Tube under High Heat Flux Conditions

*Koki Kitagawa, Kohei Matsui

Kyushu Institute of Technology, Department of Space Systems Engineering

Session o-1-5) Mar 4 (Fri) 16:00 - 17:15 [Meeting Room4]

Solid fuel combustion

Chairpersons: Toru Shimada (JAXA)
Landon Kamps (Hokkaido University)

2022-o-1-22 (16:00 - 16:15)

Visualization of Multiport PMMA Fuel Torch for Rocket Ignition

*Shota Inoue, Shota Hirai, Mai Fukada, Yusuke Takada, Landon Kamps, Harunori Nagata

Hokkaido University

2022-o-1-23 (16:15 - 16:30)

Experimental Observation of Condensed Combustion Products during Combustion of Magnesium in Water Vapor

*Keita Nishii, Hiroyuki Koizumi, Kimiya Komurasaki

The University of Tokyo

2022-o-1-24 (16:30 - 16:45)

Development of Rocket Reignition Device Using Electrically Conductive Plastic

*Shota Hirai, Yownin Albert M. Leung, Landon Kamps, Harunori Nagata

Hokkaido University

2022-o-1-25 (16:45 - 17:00)

Review of Alternative Sustainable Fuels for Hybrid Rocket Propulsion

*Francesco Barato

University of Padua, Department of Industrial Engineering

2022-o-1-26 (17:00 - 17:15)

Cellular Structures for Solid Fuel Grain Reinforcement: Mechanical and Combustion Performance in Conventional and Non-Conventional Hybrid Rocket Engines

*CHRISTIAN PARAVAN, Riccardo Bisin, Anwer Elsayed Hashish, Alberto Verga

POLITECNICO DI MILANO, Aerospace Science and Technology Department

Technical Session Oral

Session a-1) Feb 28 (Mon) 15:40 - 16:20 [Meeting Room31]

Conceptual study & Systems study

Chairperson: TBD

2022-a-02 (15:40 - 16:00)

Concept Study on New Heavy Rocket with Ejector Rocket Engines (Including Study on Thrust Augmentation)

*Kenji Kobayashi, Sharma Gopal

Sojo University Department of Aerospace Systems Engineering

2022-a-04 (16:00 - 16:20)

Current Environmental Concerns about Space and Suborbital Launch Activities

*Filippo Maggi, Stefania Carlotti

Politecnico di Milano, Dept. Aerospace Science and Technology

Session a-2) Mar 1 (Tue) 9:00 - 10:00 [Meeting Room31]

Air-breathing Engine 1

Chairperson: TBD

2022-a-05 (9:00 - 9:20)

Temperature Measurement of Turbulent Exhaust Jet by Two-band Emission Method

*Genki Kawamura[2], Takumi Yamaguchi[2], Yoshinari Kobayashi[1], Shuhei Takahashi[1]

[1]Gifu University Department of Engineering,
[2]Gifu University Graduate School of Natural Science and Technology Department of Energy Engineering

2022-a-07 (9:20 - 9:40)

Catalytic Effect on Thermal Decomposition of Hydrocarbon Fuel within a Tube Simulating Cooling Channel

*Sadatake Tomioka[1], Motoki Hattori[2], Takuo Onodera[1], Tatsushi Isono[1]

[1]Japan Aerospace Exploration Agency, Kakuda Space Center, [2]Tohoku University, Graduate School of Engineering

2022-a-08 (9:40 - 10:00)

Oscillations of Hydrocarbon Fuel Flow in a Heated Tube Under Supercritical Pressure Conditions

*Takuo Onodera[1], Yosuke Kone[2], Tatsushi Isono[1], Sadatake Tomioka[1]

[1]Japan Aerospace Exploration Agency, Research and Development Directorate, Research Unit IV,
[2]Tohoku University, Graduate School of Engineering, Department of Aerospace Engineering

Session a-3) Mar 1 (Tue) 11:00 - 12:40 [Meeting Room31]

Air-breathing Engine 2

Chairperson: TBD

2022-a-09 (11:00 - 11:20)

Design of a Scramjet Engine Supply System using Transient Analysis

*Kota Kubosaki[1], Sadatake Tomioka[2]

[1]Tohoku University, [2]JAXA, Kakuda Space Center

2022-a-10 (11:20 - 11:40)

Unsteady Numerical Analysis of a Dual-Mode Scramjet Combustor with Cavity

*Hironobu Nishiguchi[1], Masatoshi Kodera[2], Sadatake Tomioka[2]

[1]Tohoku University, [2]JAXA Kakuda Space Center

2022-a-11 (11:40 - 12:00)

RANS Simulations of a Supersonic Combustor with Methane/Ethylene Mixed Fuel

*Masatoshi Kodera, Sadatake Tomioka, Masahiro Takahashi

Japan Aerospace Exploration Agency

2022-a-12 (12:00 - 12:20)

Experimental Investigation on the Effect of the Intake Throat Height on the Buzz Characteristics in the Ramjet Engine for High-Mach Integrated Control Experiment (HIMICO)

*Manami Fujii[1], Yuki Fujimori[1], Yusuke Hoshiya[1], Yuki Kuwabara[1], Rintaro Tanaka[1], Tetsuya Sato[1], Hidemi Takahashi[2], Hideyuki Taguchi[3]

[1]Department of Applied Mechanics and Aerospace Engineering, Waseda University, [2]Aeronautical Technology Directorate, Japan Aerospace Exploration Agency, [3]Research and Development Directorate, Japan Aerospace Exploration Agency

2022-a-13 (12:20 - 12:40)

A Streamline-traced Air Inlet for the Reusable Sounding Rocket with Airbreathing Engines

*Yusuke Maru[1], Haruaki Seta[2], Kazuma Matsumoto[2], Tetsuya Sato[2]

[1]Japan Aerospace Exploration Agency, [2]Department of Applied Mechanics and Aerospace Engineering, Waseda University

Session a-4) Mar 1 (Tue) 16:00 - 17:40 [Meeting Room31]

Combustion

Chairperson: TBD

2022-a-14 (16:00 - 16:20)

Ground Test Evaluation of a Supersonic Combustor Model for JAXA Flight Experiment in Mach 6 Flight Condition

*Masahiro Takahashi, Sadatake Tomioka, Masao Takegoshi, Kan Kobayashi, Takuo Onodera, Toshihito Saito

Japan Aerospace Exploration Agency, Kakuda Space Center

2022-a-15 (16:20 - 16:40)

Study on Nonlinear Dynamics Using the State Space of Combustion Oscillation in a Rocket Combustor

*Fumiya Arai, Kazuki Iemura, Masanori Saito, Mitsuaki Tanabe

College of Science and Technology, Nihon University

2022-a-16 (16:40 - 17:00)

Experimental Study on Combustion Efficiency of Water-Vapor and Aluminum-Powder Combustion Aiming for Micro-Chemical Propulsion

*Masaya Murohara[1], Hiroyuki Koizumi[2], Kimiya Komurasaki[1]

[1]the University of Tokyo, Department of Aeronautics and Astronautics, [2]the University of Tokyo, Department of Advanced Energy

2022-a-17 (17:00 - 17:20)

Combustion Characteristics of Ethanol-based Gel Fuel Droplet with Al Powder under Different Oxidant Concentration Convection

*Junyu Zhu, Akiyo Takahashi, Kenichi Takahashi

Nihon Univ. College of Science and Technology

2022-a-18 (17:20 - 17:40)

Flame Characteristics of a High-Pressure LOX/CNG Rocket Combustor with Large Optical Access

*Jan Martin[1], Wolfgang Armbruster[1], Dmitry Suslov[1], Robert Stützer[1], Justin Hardi[1], Michael Oschwald[1,2]

[1]German Aerospace Center (DLR), Institute of Space Propulsion, [2]RWTH Aachen University, Institute of Jet Propulsion and Turbomachinery

Session a-5) Mar 2 (Wed) 9:00 - 10:20 [Meeting Room31]

Liquid Rocket 1

Chairperson: TBD

2022-a-19 (9:00 - 9:20)

Thermal Behavior of Eutectic Mixture of Ammonium Dinitramide and Hydrazide Compounds

*Hiroki Matsunaga[1], Mamoru Hayata[2], Hiroto Habu[3], Masaru Noda[1], Atsumi Miyake[4]

[1]Fukuoka Univ. Department of Chemical Engineering, [2]Carlit Holdings Co., Ltd, [3]JAXA/ISAS. Division of Space Flight Systems, [4]Yokohama National Univ. Graduate School of Environment and Information Sciences

2022-a-20 (9:20 - 9:40)

The Novel Ignition Method via Electrolysis for Ammonium Dinitramide based Energetic Ionic Liquid

*Kiichiro Iguchi, Kento Shiota, Yu-ichiro Izato, Atsumi Miyake

Yokohama National University

2022-a-21 (9:40 - 10:00)

Fundamental Study on Pt/TiO2 Catalyst to Aim Extension of Catalyst Life for Microsatellite-Friendly Multi-Purpose Propulsion System (MFMP-PROP)

*Toshiaki Iizuka[1], Yuya Ikeda[1], Takeru Yuzawa[1], Takehito Kato[1], Ryusei Hayatomo[2], Kazuki Hirayama[2], Hiroyoshi Yasuhira[2], Haruki Sashida[2], Kohdai Ono[2], Takuto Iijima[2], Hironori Sahara[2]

[1]National Institute of Technology, Oyama College, [2]Tokyo Metropolitan University

2022-a-22 (10:00 - 10:20)

Design of an Electric-Chemical Dual-Mode thruster of Green Propellant

*Yumina Iwata, Akira Kakami

Department of Aeronautics and Astronautics, Tokyo Metropolitan University, Japan

Session a-6) Mar 2 (Wed) 11:00 - 12:20 [Meeting Room31]

Liquid Rocket 2

Chairperson: TBD

2022-a-23 (11:00 - 11:20)

Research on Bi-propellant Mode Operation of Microsatellite-Friendly Multi-Purpose PROPulsion System (MFMP-PROP)

*Ryusei Hayatomo[1], Kazuki Hirayama[1], Hiroyoshi Yasuhira[1], Haruki Sashida[1], Kohdai Ono[1], Takuto Iijima[1], Hironori Sahara[1], Yuya Ikeda[2], Takeru Yuzawa[2], Toshiaki Iizuka[2], Suzuki Daisuke[3]

[1]Tokyo Metropolitan university, [2]National Institute of Technology, Oyama College, [3]ALE Co., Ltd

2022-a-24 (11:20 - 11:40)

Advanced Performance Prediction Model Considering Losses in Spacecraft Engine Combustion Chamber

*Soma Tauchi, Chihiro Inoue

Kyushu Univ. Department of Aeronautics and Astronautics

2022-a-25 (11:40 - 12:00)

Pulse Performance Prediction of Bipropellant Thruster by Unsteady Stream Tube Model

*Yuki Oishi, Chihiro Inoue

Kyushu Univ. Department of Aeronautics and Astronautics

2022-a-26 (12:00 - 12:20)

Influence of L^* on Combustion Stability of N_2O/DME Thruster

*Yuki Furuya, Akira Kakami

Tokyo Metropolitan Univ. Department of System Design

Session a-7) Mar 2 (Wed) 16:00 - 17:20 [Meeting Room31]

Liquid Rocket 3

Chairperson: TBD

2022-a-27 (16:00 - 16:20)

Inducer Cavitation Control via Inlet Swirl

*Christopher Groll[1,2], Tobias Traudt[2], Michael Oschwald[2], Stefan Schlechtriem[2], Armin Herbertz[3]

[1]University of Stuttgart, Institute of Space Systems, Germany, [2]German Aerospace Center, Institute of Space Propulsion, Germany, [3] European Space Agency, ESTEC, Netherlands

2022-a-29 (16:20 - 16:40)

Liquid Upper Stage Demonstrator Engine (LUMEN): Component Test Results and Project Progress

*Tobias Traudt, Michael Börner, Dmitry Suslov, Robson dos Santos Hahn, Anirudh Mukund Saraf, Jan Christian Deeken, Justin Hardi, Stefan Schlechtriem

German Aerospace Centre (DLR)

2022-a-30 (16:40 - 17:00)

A Parametric Blade Design Study in the Baljé-Diagram: Application to Supersonic Impulse Turbines

*Robson Hahn[1], Louis Souverein[2], Tobias Traudt[1]

[1]German Aerospace Center, [2]Ariane Group

2022-a-31 (17:00 - 17:20)

Performance Analysis and Design Characterization of a Supersonic Impulse Turbine

*Robson Hahn[1], Tobias Traudt[1], Nima Fard Afshar[2], Stefan Henninger[2], Jan Deeken[1], Michael Oschwald[1], Stefan Schlechtriem[1]

[1]German Aerospace Center, [2]RWTH Aachen University

Session a-8) Mar 3 (Thu) 9:00 - 10:00 [Meeting Room31]

Solid Rocket & Detonation Engine

Chairperson: TBD

2022-a-32 (9:00 - 9:20)

Development and Flight Test of Small Solid Rocket Motor Using Glycidyl Azide Polymer/ Ammonium Perchlorate Propellant

*Kazuki Nagao[1], Tamiaki Takasago[1], Masaya Fujita[2], Yutaka Wada[2], Kaiichi Baba[3], Tatsuya Oda[3], Katsuya Hasegawa[4], Keiichi Hori[4]

[1]Graduate School of Chiba Institute of Technology, Japan, [2]Chiba Institute of Technology, Japan, [3]NOF CORPORATION, Japan, [4]JAXA, Japan

2022-a-33 (9:20 - 9:40)

Laser Ignition Characteristics of Low-temperature Boron/potassium Nitrate

*Kohei Matsui[1], Yoshiki Matsuura[2], Koki Kitagawa[1]

[1]Kyushu Institute of Technology, Department of Space Systems Engineering, [2]IHI Aerospace Co., Ltd.

2022-a-35 (9:40 - 10:00)

Thrust Performance of Rotating Detonation Engines Using a Methane-Oxygen Mixture

*Kazuma Kawasaki[1], Haruhiro Kawana[1], Kanta Ohno[1], Kazuhiro Ishii[1], Makoto Kojima[2], Hideto Kawashima[2]

[1]Yokohama National Univ. Department of Mechanical Engineering , [2]JAXA

Session b-1) Feb 28 (Mon) 15:40 - 17:20 [Reception Hall]

Ion Thrusters / Cathodes

Chairperson: TBD

2022-b-01 (15:40 - 16:00)

Investigation of Plasma Conditions in Ion Engine with Sublimable Propellants

*Ryo Shiraki[1], Naoji Yamamoto[1], Masakatsu Nakano[2], Yasushi Ohkawa[3], Ikkoh Funaki[3]

[1]Kyushu University. Interdisciplinary Graduate School of Engineering Sciences, [2]Tokyo Metropolitan College of Industrial Technology, [3]JAXA

2022-b-02 (16:00 - 16:20)

Research on Ion Engine Alternative Propellants Based on Numerical Simulation

*Zefeng Hu, Naruya Hiroike, Naoji Yamamoto, Morita Taichi, Yuji Koide

Kyushu Univ. Department of Advanced Energy Engineering Science Interdisciplinary Graduate School of Engineering Sciences

2022-b-03 (16:20 - 16:40)

Effect of Spacecraft Charging on Surface Erosion of Spacecraft due to Backflow of Ion Thruster

*Takanobu Muranaka[1], Kazuma Ueno[1], Mamoru Kato[1], Shunsuke Otsuka[1], Ayumu Nono[2], Yoshinori Nakayama[3], Satoshi Hosoda[4], Kazutaka Nishiyama[4]

[1]Chukyo University, [2]The University of Tokyo, [3]National Defense Academy, [4]Japan Aerospace Exploration Agency

2022-b-04 (16:40 - 17:00)

Scattering Behavior of Thermal Molecular Beams at Microstructured Surface for High Compression Intake System of Air Breathing Ion Engine

*Keisuke Ezaki[1], Kosuke Shoda[1], Kazuki Itatani[1], Yuki Jotaki[2], Yusaku Ashida[2], Koki Sugimoto[2], Takashi Ozawa[3], Yusuke Yamashita[4], Kazutaka Nishiyama[5], Kumiko Yokota[1], Masahito Tagawa[1]

[1]Kobe Univ. Graduate School of Engineering, [2]Kobe Univ. Department of Mechanical Engineering, [3]Japan Aerospace Exploration Agency, [4]The University of Tokyo, [5]Institute of Space and Astronautical Science

2022-b-05 (17:00 - 17:20)

The Fluctuation Characteristics in the Hollow Cathode Plume

*Daisuke Imaguchi[1], Yuya Oshio[2], Hiroki Watanabe[3], Shun Imai[3], Ikkoh Funaki[3], Yoshiki Yamagiwa[1]

[1]Shizuoka University, [2]Ryukoku University, [3]JAXA

Session b-2) Mar 1 (Tue) 9:00 - 10:20 [Reception Hall]

Hall Thrusters 1

Chairperson: TBD

2022-b-06 (9:00 - 9:20)

Rotating Spoke Behaviour and Anomalous Electron Transport in Hall Thruster

*Masahiro Nonaka[1], Junko Yamasaki[1], Yutaro Murayama[1], Tetsuya Kobayashi[1], Emi Maruyama[1], Hiroki Ito[1], Tsubasa Kurihara[1], Toramu Morita[1], Kohei Shimamura[2], Shigeru Yokota[2]

[1]Engineering Mechanics and Energy, University of Tsukuba, Tsukuba, Japan
[2]Faculty of Engineering, Information and Systems, University of Tsukuba, Tsukuba, Japan

2022-b-07 (9:20 - 9:40)

Investigation of Plume Interference Effects on Racetrack Anode-layer SBS System

*Mitsuhiro Nagamine, Akane Kato, Takeshi Miyasaka, Makoto Asahara

Gifu University. Department of Natural Science and Technology

2022-b-09 (9:40 - 10:00)

Study of the Micro-turbulence Plasma Structure on a Hall-effect Thruster Using 2D Kinetic Simulation

*Naoki Tsunezawa, Masayuki Takahashi, Naofumi Ohnishi

Tohoku Univ. Department of Aerospace Engineering

2022-b-10 (10:00 - 10:20)

Prediction of Discharge Current Using Reservoir Computing in Electric Propulsion

*Kansei Ito, Naoji Yamamoto, Kai Morino

Kyushu Univ. Interdisciplinary Graduate School of Engineering Sciences.

Session b-3) Mar 1 (Tue) 11:00 - 12:40 [Reception Hall]

Hall Thrusters 2

Chairperson: TBD

2022-b-11 (11:00 - 11:20)

Performance Characteristics of Hall Thrusters for Transportation in the Solar System -Use of Carbon Dioxide, Methane, Ammonia, Hydrogen, Helium, Air and Water/Ice etc. in the Planets and Satellites to Propellants-

*Takahiro Itsuki[1], Takuma Nagayoshi[2], Hirokazu Tahara[2], Tomoyuki Ikeda[3], Yoshiyuki Takao[4]

[1]Osaka Sangyo University, Graduate School of Engineering, Division of Mechanical Engineering,
[2]Osaka Sangyo University, Department of Mechanical Engineering, [3]Tokai University, [4]Nishinippon Institute of Technology

2022-b-12 (11:20 - 11:40)

The R&D Program of 6-kW-class Hall Thruster at JAXA

*Ikkoh Funaki, Tadahiko Sano, Tsutomu Fukatsu

JAXA

2022-b-13 (11:40 - 12:00)

Magnetic-layer type hall thruster "ST-II"

*Takayuki Asai, Tatsuki Matsuo, Satoru Shitara, Yuuto Matumoto, Hideyuki Horisawa, Tomoyuki Ikeda

Tokai University Department of Aeronautics and Astronautics

2022-b-14 (12:00 - 12:20)

Development of Hall Thruster for Small Satellites

*Tetsuya Kobayashi, Junko Yamasaki, Masahiro Nonaka, Hiroki Ito, Emi Maruyama, Yutaro Murayama, Tsubasa Kurihara, Toramu Morita, Shigeru Yokota, Kohei Shimamura

Department of Engineering Mechanics and Energy. University of Tsukuba

2022-b-15 (12:20 - 12:40)

New Discharge Power Supply of 6-kW Hall Thruster using Voltage-Doubler-Type Rectifier

*Yoshiki Matsunaga[1], Hiroki Watanabe[1], Shun Imai[1], Hiroaki Kusawake[1], Toru Takahashi[2], Kazuhiro Kajiwara[3], Fujio Kurokawa[3], Ikkoh Funaki[1]

[1]Japan Aerospace Exploration Agency, [2]Takahashi Denki Seisakusho Corporation, [3]Nagasaki Institute of Applied Science

Session b-4) Mar 1 (Tue) 16:00 - 17:40 [Reception Hall]

Hall Thrusters 3

Chairperson: TBD

2022-b-16 (16:00 - 16:20)

Hollow anode characterization for low-power Hall thrusters

*Satoru Shitara, Yuto Matsumoto, Rio Yabuki, Tatsuki Matsuo, Tomoyuki Ikeda, Hideyuki Horisawa

Tokai Univ.Department of Aeronautics and Astronautics

2022-b-17 (16:20 - 16:40)

Ionization Enhancement of Argon Propellant by Applying a Magnetic Field to Propellant Supply in a Hall thruster

*Emi Maruyama, Junko Yamasaki, Masahiro Nonaka, Yutaro Murayama, Tetsuya Kobayashi, Tsubasa Kurihara, Toramu Morita, Shigeru Yokota

Univ. of Tsukuba, Department of Engineering Mechanics and Energy

2022-b-18 (16:40 - 17:00)

The Effect of the Outer Coil Configuration on the Thrust Performance of the 6-kW-class Hall Thruster

*Shun Imai[1], Hiroki Watanabe[1], Yoshiki Matsunaga[1], Daisuke Imaguchi[2], Nobuhito Onishi[3], Ikkoh Funaki[1]

[1]Japan Aerospace Exploration Agency, [2]Shizuoka Univ. Department of Engineering, [3]Tokai Univ. Department of Mechanical Engineering

2022-b-19 (17:00 - 17:20)

Effects of Electron Sources on Propulsion Performance in Hall Thrusters

*Yutaro Murayama, Junko Yamasaki, Emi Maruyama, Tetsuya Kobayashi, Hiroki Ito, Tsubasa Kurihara, Toramu Morita, Shigeru Yokota, Kohei Shimamura

University of Tsukuba

2022-b-20 (17:20 - 17:40)

Scaling Laws for the design of High - voltage Hall Thrusters

*Yuto Matsumoto[1], Ikkoh Funaki[2], Hiroki Watanabe[2], Yuya Oshio[3], Hideyuki Horisawa[1]

[1]Tokai Univ., [2]JAXA, [3]Ryukoku Univ.

Session b-5) Mar 2 (Wed) 9:00 - 9:40 [Reception Hall]

Arcjets / MPD Thrusters

Chairperson: TBD

2022-b-21 (9:00 - 9:20)

Performance Characteristics of DC Arcjet Thrusters -Use of Carbon Dioxide, Methane, Ammonia, Hydrogen, Helium, Air and Water/Ice etc. in Planets and Satellites in the Solar System to Propellants-

*Kentaro Kaji[1], Kazuki Shibutani[1], Ryo Ikemoto[1], Ayano Yoshida[1], Hirokazu Tahara[1], Ai Momozawa[2], Daisuke Nakata[3], Tomoyuki Ikeda[4], Yoshiyuki Takao[5], Yuichiro Nogawa[6], Takashi Wakizono[7], Masaya Toyama[8]

[1]Osaka Sangyo University, Department of Mechanical Engineering , [2]Tokyo City University, [3]Muroran Institute of Technology, [4]Tokai University, [5]Nishinippon Institute of Technology, [6]Splije, Inc., [7]High Serve, Inc., [8]Pasett, Inc.

2022-b-22 (9:20 - 9:40)

Performance Characteristics of High-Thrust High-specific-Impulse Steady-State Magneto-Plasma-Dynamic Thrusters for Transportation in the Solar System -Use of Carbon Dioxide, Methane, Ammonia, Hydrogen, Helium, Air and Water/Ice etc. in the Planets and Satellites to Propellants-

*Ayano Yoshida[1], Ryo Ikemoto[1], Kazuki Shibutani[1], Kentaro Kaji[1], Hirokazu Tahara[1], Ai Momozawa[2], Daisuke Nakata[3], Tomoyuki Ikeda[4], Yoshiyuki Takao[5], Takashi Wakizono[6], Masaya Toyama[7]

[1]Osaka Sangyo University, Department of Mechanical Engineering , [2]Tokyo City University, [3]Muroran Institute of Technology, [4]Tokai University, [5]Nishinippon Institute of Technology, [6]High Serve, Inc., [7]Pasett, Inc.

Session b-6) Mar 2 (Wed) 11:00 - 12:20 [Reception Hall]

Pulsed Plasma Thrusters / Vacuum Arc Thrusters

Chairperson: TBD

2022-b-24 (11:00 - 11:20)

Research and Development of Commercially-Available High-Total-Impulse Electrothermal Pulsed Plasma Thruster Systems from Electric Energy/Power 1J/1W for 1U(1kg) Cubesats to 50J/50W for 50cm-Cube (50kg) Nano-Satellites in Osaka Sangyo University

*Takuma Unegawa[1], Maika Uedahira[1], Kazuki Aoyagi[1], Tomoya Shimada[1], Ken-ichiro Oka[2], Tomonori Kimura[2], Takayuki Kuri[2], Kenshin Motoe[2], Hirokazu Tahara[1], Tomoyuki Ikeda[3], Yoshiyuki Takao[4], Takashi Wakizono[5]

[1]Osaka Sangyo University, Department of Mechanical Engineering , [2]Osaka Sangyo University, Solar System Space Development Project, [3]Tokai University, [4]Nishinippon Institute of Technology, [5]High Serve, Inc.

2022-b-25 (11:20 - 11:40)

Temporal and Spatial Ion Velocity Distributions of a Short-pulse Coaxial Laser-assisted Pulsed Plasma Thruster

*Satoru Shitara, Takuro Mikami, Maekawa Shuto, Hideyuki Horisawa

Tokai Univ.Department of Aeronautics and Astronautics

2022-b-26 (11:40 - 12:00)

Investigations on Plume Characteristics of Pulsed Electric ThRuster of the University of Stuttgart (PETRUS)

*Zhe Zhang, Felix Schafer, Georg Herdrich

University of Stuttgart, Institute of Space Systems

2022-b-27 (12:00 - 12:20)

Propellant Development for Improving the Discharge Frequency of Vacuum Arc Thruster with Plasma Interaction Ignition

*Taiga Okamoto

Kyushu Institute of Technology Department of Space Major

Session b-7) Mar 2 (Wed) 16:00 - 16:40 [Reception Hall]

Electrospray Thrusters / Advanced Micro Thrusters

Chairperson: TBD

2022-b-28 (16:00 - 16:20)

Design and Fabrication of Ionic Liquid Electrospray Thruster with Two-stage Electrodes

*Akane Nishimura[1], Yoshinori Takao[2], Toshiyuki Tsuchiya[1]

[1]Kyoto University, [2]Yokohama National University

2022-b-29 (16:20 - 16:40)

Fabrication of SU-8 Based Emitter Arrays for Ionic Liquid Electrospray Thrusters

*Takumi Shingu[1,2], Masayoshi Nagao[2], Katsuhisa Murakami[2], Hiromasa Murata[2], Sommawan Khumpuang[2,3], Shiro Hara[2,3], Yoshinori Takao[4]

[1]Department of Mechanical Engineering, Materials Science, and Ocean Engineering, Yokohama National University, [2]Device Technology Research Institute, National Institute of Advanced Industrial Science and Technology, [3]Minimal Fab Promoting Organization, [4]Division of Systems Research, Yokohama National University

Session b-8) Mar 3 (Thu) 9:00 - 10:00 [Reception Hall]

RF Thrusters

Chairperson: TBD

2022-b-31 (9:00 - 9:20)

Plasma Distribution Measurement of Miniature RF Plasma Thruster

*Yuya Oshio[1], Rin Hiwatashi[1], Hiroyuki Nishida[2], Hirotaka Ostu[1]

[1]Ryukoku University, [2]Tokyo University of Agriculture and Technology

2022-b-33 (9:20 - 9:40)

Numerical Analysis on Effect of Magnetic Cusp on Discharge Characteristic in RF Plasma Thruster

*Xiang Ma, Takeru Furukawa, Hiroyuki Nishida

Tokyo University of Agriculture and Technology

2022-b-34 (9:40 - 10:00)

Dependence of Electromagnetic Force on Applied Current in Electrodeless Plasma Thruster Using $m = 0$ Half-cycle Acceleration Method

*Takeru Furukawa[1], Taisuke Torin[1], Daisuke Kuwahara[2], Hiroyuki Nishida[1], Shunjiro Shinohara[1]

[1]Tokyo University of Agriculture and Technology , [2]Chubu University

Session b-9) Mar 3 (Thu) 11:00 - 12:20 [Reception Hall]

RF Thrusters / Magnetic Nozzle

Chairperson: TBD

2022-b-36 (11:00 - 11:20)

Multi-Objective Design Optimization of Microwave Electrothermal Thruster

*Tsubasa Ozawa[1], Suk Hyun Yeo[2], Hideaki Ogawa[1], Milinda Suraweera[3]

[1]Kyushu Univ. Department of Aeronautics and Astronautics, [2]RMIT Univ. School of Engineering, [3]Space Machines Company

2022-b-37 (11:20 - 11:40)

Experimental investigation on a magnetically-steered radiofrequency plasma thruster

*Ryoji Imai, Kazunori Takahashi

Tohoku Univ. Department of Electrical Engineering

2022-b-38 (11:40 - 12:00)

A Magnetic Nozzle rf Plasma Thruster - Performance Improvement and rf System Development-

*Kazunori Takahashi, Ryoji Imai, Kengo Hanaoka

Tohoku Univ. Department of Electrical Engineering

2022-b-39 (12:00 - 12:20)

Effects of Neutral Distributions on Plasma Flow Through a Magnetic Nozzle

*Kazuma Emoto[1], Kazunori Takahashi[2], Yoshinori Takao[3]

[1]Yokohama National Univ. Department of Mechanical Engineering, Materials Science, and Ocean Engineering,
[2]Tohoku Univ. Department of Electrical Engineering, [3]Yokohama National Univ. Division of Systems Research

Session b-10) Mar 3 (Thu) 16:00 - 17:20 [Reception Hall]

Fusion Rocket / Magneto Plasma Sail

Chairperson: TBD

2022-b-40 (16:00 - 16:20)

Quantitative Evaluation of the Impulse-bit Generated in a Magnetic Thrust Chamber

*Taiki Inatomi[1], Taichi Morita[2], Naoji Yamamoto[2], Hideki Nakashima[2], Tomihiko Kojima[1], Eisuke Kuramoto[1], Masaki Ikebe[1], Atsushi Sunahara[3], Shinichi Namba[4], Toshiyuki Ise[5], Kazuhiro Yagi[5], Yoshitaka Mori[6], Tomoyuki Johzaki[4]

[1]Kyushu University Interdisciplinary graduate school of Engineering Sciences, [2]Kyushu University Faculty of Engineering Sciences, [3]Purdue University department of nuclear engineering , [4]Hiroshima University department of advanced science and engineering,
[5]IHI Aerospace Co., Ltd., [6]The Graduate School for the Creation of New Photonics Industries

2022-b-41 (16:20 - 16:40)

Thrust Performance of a Magnetic Thrust Chamber for Laser Fusion Rocket

*Taichi Morita[1], Toshiyuki Ise[2], Eisuke Kuramoto[1], Masaki Ikebe[1], Taiki Inatomi[1], Takuto Kojima[1], Shinichi Namba[3], Atsushi Sunahara[4], Masafumi Edamoto[5], Yoshitaka Mori[6], Tomoyuki Jhozaki[3], Yoshihiro Kajimura[7], Kazuhiro Yagi[2], Shinsuke Fujioka[8], Yuki Abe[8], Hideki Nakashima[1], Naoji Yamamoto[1]

[1]Kyushu University, [2]IHI Aerospace Co. Ltd, [3]Hiroshima University, [4]Purdue University, [5]National Institute of Technology, Gifu College,
[6]The Graduate School for the Creation of New Photonics Industries, [7]National Institute of Technology, Akashi College, [8]Osaka University

2022-b-42 (16:40 - 17:00)

Magnetohydrodynamic Analysis of Magnetoplasma Sail for Plasma Injection Angle considering Thermal Pressure and Dynamic Pressure

*Yuki murayama[1], Ryota Hara[2], Yoshiki Yamagiwa[2], Yuya Oshio[3], Hiroyuki Nishida[4], Ikkoh Funaki[5]

[1]The Graduate University for Advanced Studies, Department of Space and Astrounautical Science, [2]Shizuoka University, [3]Ryukoku University, [4]Tokyo University of Agriculture and Technology, [5]Japan Aerospace Exploration Agency

2022-b-43 (17:00 - 17:20)

Reinforcement Method of High Temperature Superconducting Coil for Magneto Plasma Sail

*Yoh Nagasaki[1], Masaki Maruyama[1], Makoto Tsuda[1], Ikkoh Funaki[2]

[1]Tohoku University, [2]JAXA

Session b-11) Mar 4 (Fri) 9:00 - 10:20 [Reception Hall]

Laser Propulsion

Chairperson: TBD

2022-b-44 (9:00 - 9:20)

Thrust Generation Mechanism through Interaction of Ultraviolet Light-emitting Diodes and Solid Polymers

*Kohei Watabe[1], Shunya Ogawa[1], Koki Inoue[1], Tomoyuki Ikeda[1], Hideyuki Horisawa[1], Shigeru Yamaguchi[1], Yoshinori Nakayama[2], Ikkoh Funaki[3]

[1]Tokai Univ. Department of Aeronautics and Astronautics, [2]Aerospace Engineering Department, The University of National Defense Academy, [3]Institute of Space and Astronautical Science, JAXA

2022-b-45 (9:20 - 9:40)

Ignition of Xenon Diode Laser Sustained Plasma by Metal Rod

*Kota Okamoto, Kazuyoshi Ishikawa, Seiichiro Takano, Makoto Matsui

Shizuoka University

2022-b-46 (9:40 - 10:00)

Effect of f-number on Generation Conditions of Argon LSP using Diode Laser

*Seiichiro Takano, Kazuyoshi Ishikawa, Kota Okamoto, Makoto Matsui

Shizuoka Univ. Department of Mechanical Engineering

2022-b-47 (10:00 - 10:20)

Numerical Investigation of Sustainable Characteristics of Solid-State-Laser Sustained Plasma

*Hiroshi Katsurayama[1], Makoto Matsui[2]

[1]Tottori Univ. Department of Mechanical and Aerospace Engineering, [2]Shizuoka Univ. Department of Mechanical Engineering

Session b-12) Mar 4 (Fri) 11:00 - 12:00 [Reception Hall]

Microwave Rocket

Chairperson: TBD

2022-b-48 (11:00 - 11:20)

A Study of a High-power RF System Configuration for a Power Station of Microwave Rocket

*Yasuhisa Oda

Setsunan university

2022-b-49 (11:20 - 11:40)

Spectroscopic Study of Microwave Breakdown Induced by 28 GH gyrotron Beam

*Tatsuki Hirano, Tomoya Suzuki, Maho Matsukura, Kohei Shimamura, Shigeru Yokota, Ryutaro Minami, Tsuyoshi Kariya

University of Tsukuba

2022-b-50 (11:40 - 12:00)

Numerical Simulation of Millimeter-wave Discharge under Subcritical Beam Intensity

*Soichiro Suzuki, Masayuki Takahashi, Naofumi Ohnishi

Tohoku Univ. Department of aerospace engineering

Session c-1) Feb 28 (Mon) 15:40 - 17:20 [Meeting Room2]

Space Environment Interactions and Material Characterizations

Chairpersons: Koji Yugo Kimoto (JAXA)
Koji Matsumoto (JAXA)

2022-c-01 (15:40 - 16:00)

Application of Adsorbents to Space Use for Prevention of Molecular Contamination

*Riyo Yamanaka[1], Anna Gubarevich[2], Katsumi Yoshida[2]

[1]Japan Aerospace Exploration Agency, [2]Tokyo Institute of Technology

2022-c-02 (16:00 - 16:20)

Research on Diamond Coating as Wear-Resistant Film for Mechanical Parts in Spacecraft

*Koji Matsumoto, Satoshi Takada

JAXA

2022-c-03 (16:20 - 16:40)

Tentative Fluence Estimation of Ionizing Radiation Originated from Solar Flare

*Minoru Iwata[1], Masahito Tagawa[2], Sumitaka Tachikawa[3]

[1]Kyushu Institute of Technology, Department of Space Systems Engineering, [2]Kobe University, [3]JAXA

2022-c-04 (16:40 - 17:00)

Evaluation of Space Debris Impact on AO-protectant Materials for MLI

*Yuko Kubo[1], Yugo Kimoto[1], Kaori Umeda[2], Sunao Hasegawa[3]

[1]Research and Development Directorate, Japan Aerospace Exploration Agency., [2]Fundamental Technology Division, Advanced Engineering Services Co., Ltd. , [3]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency.

2022-c-05 (17:00 - 17:20)

Preparation of Protective SiO2 Coating Film on Stainless Steel by Dip-coating Method and their H2O2 Compatibility

Ho-Chuan Lin[1], *Alfandy Tansyafri[1], Yao-Chung Hsu[2], Tien-Chuan Kuo[2]

[1]EW JET PRODUCTS CO., LTD., [2]National Space Organization

Session c-2) Mar 1 (Tue) 9:00 - 10:40 [Meeting Room2]

Structural Dynamics and Control

Chairpersons: Kosei Ishimura (Waseda University)
Atsuhiko Senba (Meijo University)

2022-c-06 (9:00 - 9:20)

Numerical Analysis on Optimal Deployment Configuration of Tightly-Folded Device-Laden Space Membrane

*Shuhei Yamada[1], Osamu Mori[2], Kiyoshi Ahmed Sugihara[2]

[1]The University of Tokyo, [2]JAXA

2022-c-07 (9:20 - 9:40)

Experimental Studies of Sloshing Dynamics for the Tank with Hemispheric Diaphragm

*Taro Kawano[1], Nobukatsu Okuizumi[2], Hikaru Eguchi[3], Keisuke Michigami[1], Hitoshi Hamori[1], Susumu Yasuda[1], Rie Tagai[1], Shujiro Sawai[2]

[1]Japan Aerospace Exploration Agency, Research and Development Directorate, [2]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, [3]Muroran Institute of Technology, Aerospace Plane Research Center

2022-c-08 (9:40 - 10:00)

Development of Multibody Dynamics Formulation Based on Canonical Theory

*Shuonan Dong[1], Keisuke Otsuka[1], Yinan Wang[2], Koji Fujita[3], Hiroki Nagai[3], Kanjuro Makihara[1]

[1]Tohoku University, Department of Aerospace Engineering, [2]University of Warwick , [3]Tohoku University, Institute of Fluid Science

2022-c-09 (10:00 - 10:20)

Joint Angle Control Considering Mutual Interference Friction of Transformable Spacecraft

*Kotaro Ikeda[1], Osamu Mori[2], Yosiki Sugawara[1]

[1]Aoyama Gakuin university, [2]JAXA

2022-c-10 (10:20 - 10:40)

Touchdown Experiments on Landing Gear with Electromagnetic Dampers for Planetary Landers

*Shota Iwabuchi, Kenji Minesugi

Japan Aerospace Exploration Agency

Session c-3) Mar 1 (Tue) 11:00 - 12:20 [Meeting Room2]

Deployable structures

Chairpersons: Hiroaki Tanaka (National Defense Academy of Japan)
Keisuke Otsuka (Tohoku University)

2022-c-11 (11:00 - 11:20)

Deployment Prediction of Micro Solar Sail Composed of Self-Extension Boom

*Asuka Tatara[1], Riko Tachikawa[2], Yasuyuki Miyazaki[3]

[1]The Graduate University for Advanced Studies, School of Physical Sciences, Department of Space and Astronautical Science, [2]Nihon Univ., College of Science and Technology, Department of Aerospace Engineering, [3] Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science

2022-c-12 (11:20 - 11:40)

Mechanical Properties of Retractable Self-Deployable Space Booms Consisting of Connected Shell Panels with Variable Geometry Truss

*Tomonori Sotome, Hiroshi Furuya

Tokyo Institute of Technology. Department of Mechanical Engineering

2022-c-13 (11:40 - 12:00)

Feasibility Evaluation of Two-dimensional Self-deployable Corrugated Panels for Miura-fold

*Makoto Yoshioka, Tetsuhiro Nakashima, Hiroshi Furuya

Tokyo Institute of Technology. Department of Mechanical Engineering

2022-c-14 (12:00 - 12:20)

Design of a Deployable Sandwich Panel using Shape Memory Polymers

*Ziyue Lu[1], Kosei Ishimura[1], Atsuhiko Senba[2]

[1]Waseda University, School of Creative Science and Engineering, Department of Modern Mechanical Engineering, [2]Meijo University, Department of Vehicle and Mechanical Engineering

Session c-4) Mar 1 (Tue) 16:00 - 17:20 [Meeting Room2]

Smart materials and structures

Chairpersons: Tomohiro Yokozeki (The University of Tokyo)
Taro Kawano (JAXA)

2022-c-15 (16:00 - 16:20)

Self-Deployment Rate Control for Shape Memory Polymer Convex Shell

*Atsuhiko Senba[1], Hiroshi Furuya[2]

[1]Meijo University, [2]Tokyo Institute of Technology

2022-c-16 (16:20 - 16:40)

Result of Exposure Experiment of Piezoelectric Actuators Using ExHAM

*Nozomu KOGISO[1], Hiroaki Tanaka[2], Tadashige Ikeda[3], Kosei Ishimura[4], Masahito Tagawa[5], Minoru Iwata[6], Motoharu Fujigaki[7]

[1]Osaka Prefecture University, [2]National Defense Academy, [3]Chubu University, [4]Waseda University, [5]Kobe University, [6]Kyushu Institute of Technology, [7]University of Fukui

2022-c-17 (16:40 - 17:00)

Resilient Operation of Smart Reflectors Considering Actuator Failure

*Koichi Yokota, Iida Kisumi, Nozomu Kogiso

Osaka Prefecture Univ. Department of Aerospace Engineering

2022-c-18 (17:00 - 17:20)

Proto-flight Model Development of a Lightweight Membrane Deployment Structure with Power Generation and Antenna Functions, HELIOS

*Masanori Matsushita[1], Yuki Takao[1], Kiyoshi Ahmed Sugihara[1], Osamu Mori[1], Akihito Watanabe[2], Kazuyuki Nakamura[3], Tetsuya Kusumoto[4], Genki Ohira[5], Masahiro Fujita[4], Keisuke Sugiura[6], Kotaro Ikeda[6], Ayaka Fujita[7], Shuhei Yamada[4], Maiko Yamakawa[5], Yasutaka Satou[1], Yasuyuki Miyazaki[1], Nobukatsu Okuizumi[1], Hiraku Sakamoto[8], Atsushi Shirane[8], Kenichi Okada[8]

[1]JAXA, [2]Sakase Adtech Co., Ltd., [3]Technosolver Corporation, [4]The University of Tokyo, [5]SOKENDAI, [6]Aoyama Gakuin University, [7]Tokai University, [8]Tokyo Institute of Technology

Session c-5) Mar 2 (Wed) 9:00 - 10:40 [Meeting Room2]

Structural Analysis

Chairpersons: Nozomu KOGISO (Osaka Prefecture University)
Yasutaka Satou (JAXA)

2022-c-19 (9:00 - 9:20)

Analysis of the Effect of Design Parameters on Deployment Repeatability of Two-dimensional Extensible Mast

*Takahiro Morita, Kosei Ishimura

Waseda University

2022-c-20 (9:20 - 9:40)

Vibration Characteristics of Ultra-lightweight with High-rigidity Solar Array Structure

*Sunao Nishimura, Rikiya Hayashi, Daiki Watanabe, Akihiro Miyasaka

Tokyo City University

2022-c-21 (9:40 - 10:00)

A Study on a Low-Dimensional Model of Membrane Space Structure with Flexibly Adapting to Change Design Parameters

*Daisuke Yanagihara, Masahiko Yamazaki

Nihon Univ. Graduate School of Science and Technology Department of Aerospace Engineering

2022-c-22 (10:00 - 10:20)

Numerical Analysis of Impact Properties of CFRP with CNF Dispersion Layer

*Haruna Yamaguchi[1], Naoko Kishimoto[1], Kazuaki Katagiri[2]

[1]Setsunan University, [2]Osaka Research Institute of Industrial Science and Technology

2022-c-23 (10:20 - 10:40)

Out-of-Plane Thermal Deformation of CFRP Laminated Curved Plates

Takahiko Shibata[1], *Kosei Ishimura[1], Motoharu Fujigaki[2], Kazuyuki Nakamura[3], Nobuko Nakamura[3], Kenichi Miyazaki[4]

[1]Waseda Univ. Department of Mechanical Engineering, [2]Fukui Univ. Department of Human and Artificial Intelligent Systems, [3]Technosolver Corporation, [4]Sankyo Manufacturing Co. Ltd.

Session c-6) Mar 2 (Wed) 11:00 - 12:20 [Meeting Room2]

Space Antennas

Chairpersons: Naoko Kishimoto (Setsunan University)
Hiroaki Tanaka (National Defense Academy of Japan)

2022-c-24 (11:00 - 11:20)

Improvement of Estimation Accuracy on Uncertainty Propagation Analysis of Antenna Gain for Smart Antenna

*Yuki Suzuki[1], Nozomu Kogiso[1], Takashi Yamawaki[2], Takashi Iwasa[2], Hiroaki Tanaka[3]

[1]Osaka Prefecture Univ. Department of Aerospace Engineering, [2]Tottori Univ. Department of Mechanical and Aerospace Engineering, [3]National Defense Academy Department of Aerospace Engineering

2022-c-25 (11:20 - 11:40)

Cable-Mesh Surface Design for Large Antenna Including Mesh Deformation

*Kenta Hoshii, Taisuke Sawahashi, Akihiro Miyasaka

Tokyo City University

2022-c-26 (11:40 - 12:00)

Scissors-Structure Antenna Design on Initial Deployment Force Generated by Strain Energy

*Taisuke Sawahashi[1], Kenta Hoshii[1], Akihiro Miyasaka[1], Ken'ichi Kawaguchi[2]

[1]Tokyo City University, [2]The University of Tokyo

2022-c-27 (12:00 - 12:20)

Study on Surface Error Modes of Lightweight Deployable Reflector Antennas

*Hiroaki Tanaka

National Defense Academy of Japan

Session d-1) Feb 28 (Mon) 15:40 - 17:20 [International Conference Room]

Orbit Determination & Control 1

Chairpersons: Toshihiro Chujo (Tokyo Institute of Technology)
Pablo Solano López (Universidad Rey Juan Carlos)

2022-d-01 (15:40 - 16:00)

Improving QZSS Precise Orbit Determination with Space-based and Ground-based Observations

*Kyohei Akiyama, Isao Kawano, Koichi Inoue

JAXA

2022-d-02 (16:00 - 16:20)

Low-Cost Deep Space Navigation by One-way and Two-way Combined Orbit Determination

*Kentaro Enokida, Yosuke Kawabata, Keidai Iiyama, Shinichi Nakasuka

The University of Tokyo

2022-d-03 (16:20 - 16:40)

Flight Results of GPS Receiver for Geosynchronous Satellite

*Yu Nakajima[1], Toru Yamamoto[1], Naoki Miyashita[1], Kyoji Shintate[1], Takehiro Matsumoto[1], Takushi Sakamoto[1], Ryo Harada[2], Susumu Kumagai[2]

[1]Japan Aerospace Exploration Agency, [2]NEC Space Technologies Ltd.

2022-d-04 (16:40 - 17:00)

Estimation of the Spacecraft Position Based on Point Cloud by Applying Polar Hough Transform

*Shuya Kashioka[1], Genki Ohira[1], Yuki Takao[2], Yuichi Tsuda[2]

[1]The Graduate University for Advanced Studies, SOKENDAI, [2]JAXA

2022-d-05 (17:00 - 17:20)

Image-based Estimation of the Attitude and Orbital Motion of Hayabusa2's Deployable Camera (DCAM3) around Ryugu

*Shota Kikuchi[1], Kei Shirai[2], Ko Ishibashi[1], Koji Wada[1], Rie Honda[3], Yasuhiro Yokota[4], Toshihiko Kadono[5], Yuri Shimaki[4], Naoya Sakatani[6], Kazunori Ogawa[4], Hirotaka Sawada[4], Masahiko Arakawa[2]

[1]Chiba Institute of Technology, [2]Kobe University, [3]Kochi University, [4]Japan Aerospace Exploration Agency, [5]University of Occupational and Environmental Health, [6]Rikkyo University

Session d-2) Feb 28 (Mon) 15:40 - 17:20 [Conference Room]

Attitude Determination & Control 1

Chairpersons: Hirohisa Kojima (Tokyo Metropolitan University)
Rui Qi (Beijing Institute of Technology)

2022-d-06 (15:40 - 16:00)

Wave Based Control During Retrieval of Debris Using Tethered Space Tug

*Fuzhen Yao[1], Rui Qi[1], Rui Zhong[2]

[1]Beijing Institute of Technology, [2]Beihang University

2022-d-07 (16:00 - 16:20)

Development of a Novel Sliding Mode based Control Algorithm for a Satellite with Sloshing Dynamics

*Amila Sri Madhushanka Gilimalage, Shinichi Kimura

Tokyo University of Science

2022-d-08 (16:20 - 16:40)

Reinforcement Learning for Shape and Attitude Control of Origami-Inspired Spacecraft

*Kazutoshi Ito, Tomohiro Yanao

Waseda Univ. Department of Applied Mechanics and Aerospace Engineering

2022-d-09 (16:40 - 17:00)

Adaptive Thrust Vector Control for Deorbit of Space Debris Using Electric Propulsion System

*Takahiro Sasaki, Hiroyuki Okamoto, Ryo Nakamura, Toru Yamamoto

Japan Aerospace Exploration Agency

2022-d-10 (17:00 - 17:20)

Attitude Determination for Nanosatellites Using Only a Set of Analog Sun Sensors

Murat Gokce[1], *Numan Sozen[1], Farid Gulmammadov[1], Halil Ersin Soken[2]

[1]TUBITAK Space Technologies Research Institute, [2]Middle East Technical University

Session d-3) Mar 1 (Tue) 9:00 - 10:40 [International Conference Room]

Orbit Determination & Control 2

Chairpersons: Shota Kikuchi (Chiba Institute of Technology)
Nicola Baresi (University of Surrey)

2022-d-11 (9:00 - 9:20)

Autonomous Proximity Operations at Small NEAs

*Shota Takahashi, Daniel Scheeres

University of Colorado Boulder, Department of Aerospace Engineering Sciences

2022-d-12 (9:20 - 9:40)

Dynamics and Control for Near-Earth Asteroid Orbiting Spacecraft using Solar Sails

*Xinbo Gu, Kohei Yamaguchi, Takaya Inamori

Nagoya University, Graduate School of Engineering, Department of Aerospace Engineering

2022-d-13 (9:40 - 10:00)

In-Orbit Change in Phase by Lagrange Points Stand-by Transfers

*Roger Gutierrez-Ramon[1], Yuto Takei[2], Takanao Saiki[2], Yuichi Tsuda[2], Yasuhiro Kawakatsu[2]

[1]The Graduate University for Advanced Studies, SOKENDAI. Department of Spae and Astronautical Science,
[2]Institute of Space and Astronautical Science / Japan Aerospace Exploration Agency (ISAS/JAXA)

2022-d-14 (10:00 - 10:20)

Covariance Control Approach for Stationkeeping of Halo Orbits in the Earth-Moon System

*Takuya Chikazawa[1], Naoya Ozaki[2], Kota Kakihara[3], Akihiro Ishikawa[3], Yasuhiro Kawakatsu[2]

[1]The University of Tokyo, Department of Advanced Energy, [2]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency,
[3]The University of Tokyo, Department of Aeronautics and Astronautics

2022-d-15 (10:20 - 10:40)

Guidance, Navigation, and Control of Retrograde Relative Orbits Around Phobos

*Nicola Baresi[1], Nicolo Bernardini[1], Edoardo Ciccarelli[1], Xiaoyu Fu[1], Harry Holt[1], Roberto Armellin[2]

[1]Surrey Space Centre / University of Surrey, [2]Auckland Space Institute / University of Auckland

Session d-4) Mar 1 (Tue) 11:00 - 12:20 [International Conference Room]

Orbital Dynamics 1

Chairpersons: Kohei Yamaguchi (Nagoya University)
Daniel J Scheeres (University of Colorado Boulder)

2022-d-16 (11:00 - 11:20)

Lunar Resonant Retrograde Periodic Orbit around the Earth

*Kenta Oshima

Hiroshima Institute of Technology

2022-d-17 (11:20 - 11:40)

Stability Analysis of Three-dimensional Distant Retrograde Orbits

*Kazuya Oishi, Satoshi Satoh, Katsuhiko Yamada

Osaka University, Department of Mechanical Engineering.

2022-d-18 (11:40 - 12:00)

Small-Amplitude Quasi-Periodic Orbit around Sun-Earth Libration Points Controlled by Solar Radiation Pressure

*Toshihiro Chujo[1], Yuki Kubo[2], Tetsuya Kusumoto[2]

[1]Tokyo Institute of Technology, [2]The University of Tokyo

2022-d-19 (12:00 - 12:20)

A Fast and Accurate Earth Radiation Pressure Model for Low-Drag Low Earth Orbit

*Maximilien BERTHET[1], Kojiro SUZUKI[2]

[1]Department of Aeronautics and Astronautics, The University of Tokyo, Japan, [2]Department of Advanced Energy, The University of Tokyo, Japan

Session d-5) Mar 1 (Tue) 16:00 - 17:20 [International Conference Room]

Orbital Dynamics 2

Chairpersons: Yuki Takao (JAXA)
Ji Hyun Park (Nagoya University)

2022-d-21 (16:00 - 16:20)

A Dynamics-leveraging Guidance and Control Architecture for Autonomous Rendezvous and Docking in the Restricted Three-Body Problem

*Sergio Cuevas del Valle[1], Hodei Urrutxua Cereijo[1], Pablo Solano López[1]

[1]Aerospace Systems and Transport Research Group (GISAT-ASTRG) | Universidad Rey Juan Carlos

2022-d-22 (16:20 - 16:40)

A Fast Analytical Prediction Method for Orbit-Attitude Performance of Solar Sails in LEO Including Air Drag and Eclipses

*Maximilien BERTHET[1], Kojiro SUZUKI[2]

[1]Department of Aeronautics and Astronautics, The University of Tokyo, Japan, [2]Department of Advanced Energy, The University of Tokyo, Japan

2022-d-23 (16:40 - 17:00)

Design of Low Energy Transfer Trajectories from Earth to Europa with Ballistic Capture

*Kanta Ikeda, Naoki Hiraiwa, Mai Bando, Shinji Hokamoto

Kyushu Univ. Department of Aeronautics and Astronautics

2022-d-24 (17:00 - 17:20)

Preliminary Mission Analysis for the Hayabusa2 Extended Mission in the Vicinity of 1998 KY26

*Shota Kikuchi[1], Yuya Mimasu[2], Takanao Saiki[2], Yuto Takei[2], Hitoshi Ikeda[2], Yuichi Tsuda[2]

[1]Chiba Institute of Technology, [2]Japan Aerospace Exploration Agency

Session d-6) Mar 1 (Tue) 9:00 - 10:20 [Conference Room]

Attitude Determination & Control 2

Chairpersons: Kenji Uchiyama (Nihon University)
Xiaofeng Wu (Sydney University)

2022-d-25 (9:00 - 9:20)

Semi-Optimal Control Law for Minimum-Time Maneuver of Satellite with Pyramid-Type VSCMG

*Kohei Oikawa[1], Takehiro Higuchi[2], Motoharu Fujii[1], Naoto Hoshika[1], So Kaieda[3], Ohmi Fuchiwaki[4]

[1]Yokohama National University Graduate School of Engineering Science, [2]Yokohama National University Faculty of Environment and Information Science, [3]Yokohama National University College of Engineering Science, [4]Yokohama National University Faculty of Engineering

2022-d-26 (9:20 - 9:40)

Inverse-Kinematics Steering Law for Double Gimbal Scissored-Pair Control Moment Gyros

*Ryo Kawamoto, Hirohisa Kojima, Sajjad Keshtkar

Tokyo Metropolitan University

2022-d-27 (9:40 - 10:00)

Backstepping Controller Design for Satellite Using Spherical Control Moment Gyroscope

*Reiji Kobayashi, Kenji Uchiyama, Kai Masuda

Nihon Univ. Department of aerospace engineering

2022-d-28 (10:00 - 10:20)

Simultaneous Control of Sway and Torsional Vibrations in Suspended Systems with a Momentum Wheel and a Reaction Wheel

*Toshihiko Nakano, Hina Takasaki

National Institute of Technology, Oita College

Session d-7) Mar 1 (Tue) 11:00 - 12:00 [Conference Room]

Attitude Dynamics

Chairpersons: Yasuhiro Shoji (Kanazawa University)
Halil Ersin Soken (Middle East Technical University)

2022-d-29 (11:00 - 11:20)

Analyzing Defunct Satellite De-tumbling using a Finite Element Method

*Ryotaro Sakamoto, Daniel J Scheeres
University of Colorado Boulder

2022-d-30 (11:20 - 11:40)

Effects of Rotational Joint Directions of Variable Structure on Non-holonomic Features

*Saki Takeuchi, Kanta Ikeda, Mai Bando, Shinji Hokamoto
Kyushu Univ. Department of Aeronautics and Astronautics

2022-d-31 (11:40 - 12:00)

Attitude Control of Low Earth Orbit Satellites with Variable Shape Mechanisms utilizing Disturbance Torque and Magnetic Torque

*Kiyona Miyamoto, Toshihiro Chujo, Kei Watanabe, Saburo Matunaga
Tokyo Institute of Technology

Session d-8) Mar 2 (Wed) 9:00 - 10:00 [International Conference Room]

Mission Design 1

Chairpersons: Yosuke Kawabata (The University of Tokyo)
Sajjad Keshtkar (Tokyo Metropolitan University)

2022-d-32 (9:00 - 9:20)

Rapid Filtering Method for Asteroid Exploration Candidate Searches

*Chloe Jeneva Long, Anivid Pedros-Faura, Jay McMahon
University of Colorado Boulder

2022-d-34 (9:20 - 9:40)

Trajectory and Attitude Planning during Deep Space Insertion from GTO for Microsatellite having High Thrust Propulsion System

*Tomotaka Yamamoto, Yosuke Kawabata, Ryu Funase, Shinichi Nakasuka
The University of Tokyo

2022-d-35 (9:40 - 10:00)

Study on Mission Design Software for Lunar Orbital Platform-Gateway Utilization Mission

*Naoya Ozaki[1], Kanta Yanagida[2], Takuya Chikazawa[2], Toshiro Shimizu[3], Shun Kodama[3], Ken Nishioka[3], Yohei Kubo[3], Kazuaki Someno[3], Takashi Shimizu[3]
[1]ISAS/JAXA, [2]University of Tokyo, [3]ISP

Session d-9) Mar 2 (Wed) 11:00 - 12:00 [International Conference Room]

Mission Design 2

Chairpersons: Satoshi Ikari (The University of Tokyo)
Xiaofeng Wu (Sydney University)

2022-d-36 (11:00 - 11:20)

Proposal for a Formation Flight Interferometry Mission in an Artificial Halo Orbit Using a Solar Sail

*Keisuke Sugiura[1], Yuki Takao[2], Kiyoshi Ahmed Sugihara[2], Yoshiki Sugawara[3], Osamu Mori[2]

[1]Graduate School of Aoyama Gakuin University, [2]Japan Aerospace Exploration Agency, [3]Aoyama Gakuin University

2022-d-37 (11:20 - 11:40)

Deep Space Exploration Missions by a Micro Solar Sail Using Hybrid Propulsion

*Yuki Takao[1], Toshihiro Chujo[2]

[1]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency,
[2]Department of Mechanical Engineering, Tokyo Institute of Technology

2022-d-38 (11:40 - 12:00)

Super Proximity Asteroid Flyby of Hayabusa2 Extended Mission

*Yuya Mimasu[1], Shota Kikuchi[2], Yuto Takei[1], Takanao Saiki[1], Hiroshi Takeuchi[1], Manabu Yamada[2], Yuichi Tsuda[1]

[1]Japan Aerospace Exploration Agency, [2]Chiba Institute of Technology

Session d-10) Mar 2 (Wed) 16:00 - 17:00 [International Conference Room]

Navigation & Control

Chairpersons: Stefania Soldini (The University of Liverpool)
Yunhua Wu (Nanjing University of Aeronautics and Astronautics)

2022-d-41 (16:00 - 16:20)

Attitude and Orbit Control System for a 6U CubeSat Mission in Low Altitude Lunar Orbit using Low-thrust Propulsion System

*Jose Rodrigo Cordova Alarcon[1], Matteo Laterza[2], Necmi Cihan Orger[1], Tze King Lam[2], Kai Sheng Khoo[2], George-Christian Potrivitu[2], Jian Wei Mark Lim[2], Sangkyun Kim[1], Mengu Cho[1]

[1]Kyushu Institute of Technology, [2]ALIENA

2022-d-42 (16:20 - 16:40)

Development of a Truss Structure Grasping End-Effector for On-orbit servicing

*Naoki Kawaguchi, Hiroki Nakanishi

Tokyo Institute of Technology. Department of Mechanical Engineering

2022-d-44 (16:40 - 17:00)

Theoretical and Measured Thrust Characteristics of Cold Gas Thruster Using Oxidizer of Hybrid Kick Motor

*Ryo Onodera, Shota Hirai, Landon Kamps, Harunori Nagata

Hokkaido University, Department of Engineering

Session d-11) Mar 3 (Thu) 9:00 - 10:00 [International Conference Room]

Formation Flying & Satellite Constellations 1

Chairpersons: Kenji Fujimoto (Kyoto University)
Arun Misra (McGill University)

2022-d-45 (9:00 - 9:20)

Propellant Balancing Considering the Propellant Remaining Difference Using a Virtual Chief

*Masaru Kambayashi[1], Takahiro Ito[2], Shin-Ichiro Sakai[2]

[1]The University of Tokyo, Department of Graduate School of Frontier Sciences, [2]Japan Aerospace Exploration Agency

2022-d-46 (9:20 - 9:40)

Formation Tracking Control Using Generalized Canonical Transformations and Sliding Mode Control of Port-Hamiltonian Systems

*Ichito Tabuchi, Satoshi Satoh, Katsuhiko Yamada

Osaka University

2022-d-47 (9:40 - 10:00)

Study on The Relative Position Control Method for Formation Flying Satellites Using Acousto-Optic Deflector

*Toshihiro Suzuki[1], Satoshi Ikari[1], Mitsuru Musha[2], Shinichi Nakasuka[1]

[1]The University of Tokyo, [2]The University of Electro-Communications

Session d-12) Mar 3 (Thu) 11:00 - 12:00 [International Conference Room]

Formation Flying & Satellite Constellations 2

Chairpersons: Takanori Iwata (JAXA)
Takeya Shima (MITSUBISHI ELECTRIC Corporation)

2022-d-49 (11:00 - 11:20)

Orbit Design for Earth-orbiting Formation Flying Satellites Aligned in a Straight Line toward an Inertial Target

*Kenta Suda, Satoshi Ikari, Ryu Funase, Shinichi Nakasuka

The University of Tokyo, Department of Aeronautics and Astronautics

2022-d-50 (11:20 - 11:40)

Optimal Constellation Design for Earth Observation Satellites

*Yuta Imoto[1], Satoshi Satoh[1], Toshihiro Obata[2], Katsuhiko Yamada[1]

[1]Osaka University, [2]Synspective Inc.

2022-d-51 (11:40 - 12:00)

On Collision Detection for Satellite Constellations Based on Spatial Hashing

*Chikako Nakayama[1], Kenji Fujimoto[1], Ichiro Maruta[1], Kazuhiro Izui[1], Akihiko Honda[2], Yuta Asano[2], Takeya Shima[2], Shoji Yoshikawa[2], Akihiko Imagi[2]

[1]Kyoto University, [2]Mitsubishi Electric Corporation

Session d-13) Mar 3 (Thu) 16:00 - 17:40 [International Conference Room]

Entry/Landing/Ascent Guidance 1

Chairpersons: Takaya Inamori (Nagoya University)
Rui Zhong (Beihang University)

2022-d-52 (16:00 - 16:20)

Real-time Hazard Detection for Planetary Landing using Spiking Neural Networks

*Hideaki Kinoshita[1], Shinichi Kimura[1], Seisuke Fukuda[2]

[1]Tokyo university of science. Department of Electrical Engineering, [2]JAXA/ISAS

2022-d-53 (16:20 - 16:40)

The Evaluation of Mechanical Models of Lander with Sloshing Fluid Fuel Tank

*Motoki Suzuki[1], Taro Kawano[2], Syujiro Sawai[2], Masahiro Nohmi[1]

[1]Shizuoka University , [2]JAXA

2022-d-54 (16:40 - 17:00)

Deployable and Identifiable Markers for a Precise Landing on an Asteroid

*Tetsuya Kusumoto[1], Osamu Mori[2]

[1]The University of Tokyo, [2]JAXA

2022-d-55 (17:00 - 17:20)

Real-Time Navigation Using Ultra-Wideband Ranging with Artificial Markers for Small Body Exploration

*Genki Ohira[1], Yuki Takao[2], Makoto Yoshikawa[2], Yuichi Tsuda[2]

[1]The Graduate University for Advanced Studies, SOKENDAI, [2]Japan Aerospace Exploration Agency (JAXA)

2022-d-56 (17:20 - 17:40)

Reentry Terminal Guidance Operation of Hayabusa2

*Yuichi Tsuda[1], Shota Kikuchi[2], Takanao Saiki[1], Hiroshi Takeuchi[1], Tetsuya Yamada[1], Yasunori Nagata[1], Satoru Nakazawa[1], Masatoshi Matsuoka[3]

[1]Japan Aerospace Exploration Agency, [2]Chiba Institute of Technology, [3]NEC Corporation

Session d-14) Mar 4 (Fri) 9:00 - 10:20 [International Conference Room]

Trajectory Design and Optimization 1

Chairpersons: Takehiro Higuchi (Yokohama National University)
Hongru Chen (Kyushu University)

2022-d-57 (9:00 - 9:20)

Minimum-Time Transfer Trajectories from Low-Earth Orbit to NRHO

*Yuta Hagiwara, Seiya Ueno, Takehiro Higuchi

Yokohama National University

2022-d-58 (9:20 - 9:40)

Halo-to-Halo Low-Thrust Transfer via Successive Convex Optimization with Intermediate Orbit Design

*Naoki Hiraiwa, Mai Bando, Shinji Hokamoto

Kyushu Univ. Department of Aeronautics and Astronautics

2022-d-59 (9:40 - 10:00)

Low-Thrust Trajectory Design Between Periodic Orbits in Bicircular Four Body Problem

*Yuki Okumura, Kenji Uchiyama, Kai Masuda

Nihon university

2022-d-60 (10:00 - 10:20)

Design of Multi-Lunar-Flyby Trajectories using Collision Orbits in a Bicircular Restricted Four-Body Model

*Ferran Gonzalez Franquesa[1], Diogene Alessandro Dei Tos[2], Yasuhiro Kawakatsu[2]

[1]The Graduate University for Advanced Studies, SOKENDAI, [2]JAXA

Session d-15) Mar 4 (Fri) 11:00 - 12:00 [International Conference Room]

Trajectory Design and Optimization 2

Chairpersons: Yusuke Oki (JAXA)
Wang Jihe (Sun Yat-sen University)

2022-d-62 (11:00 - 11:20)

Study of an Orbital Transition Scenario for Medium-sized Lunar Cargo Lander Mission

*Yuki Matsumoto, Satoshi Ueda, Junji Kikuchi, Masaru Koga, Kota Tanabe, Naoki Satoh

Japan Aerospace Exploration Agency

2022-d-63 (11:20 - 11:40)

Multidisciplinary System Design Optimization on Precise Lunar Landing Trajectories and Spacecraft Systems

*Satoshi Ueda[1], Takahiro Ito[1], Shin-ichiro Sakai[2]

[1]Japan Aerospace Exploration Agency, Research and Development Directorate,
[2]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science

2022-d-64 (11:40 - 12:00)

Robust Trajectory Optimization for Low-Thrust Orbit Transfer under Uncertainty

*Rui Ohtaki, Kenji Uchiyama, Kai Masuda

Nihon Univ. Department of Aerospace Engineering

Session d-16) Mar 4 (Fri) 16:00 - 17:20 [International Conference Room]

Trajectory Design and Optimization 3

Chairpersons: Takanao Saiki (JAXA)
Mai Bando (Kyushu University)

2022-d-65 (16:00 - 16:20)

Operational Safety Analysis on Quasi-Satellite Orbits for Martian Moon eXploration Mission

*Yusuke Oki[1], Hitoshi Ikeda[1], Kazuma Nishimura[2], Masaya Nakano[2]

[1]JAXA, [2]Fujitsu

2022-d-66 (16:20 - 16:40)

Trajectory Optimization of Mars Aerocapture with Electric Propulsion by NPC and Drag Modulation Techniques

*Tomoki Nishikawa[1], Kojiro Suzuki[2]

[1]Univ of Tokyo. Graduate School of Engineering. Department of Aeronautics and Astronautics,
[2]Univ of Tokyo. Graduate School of Frontier Sciences. Department of Advanced Energy

2022-d-67 (16:40 - 17:00)

Trajectory Design and Navigation Analysis for EQUULEUS mission

*Yosuke Kawabata[1], Takuya Chikazawa[1], Kota Kakihara[1], Stefano Campagnola[3], Ryu Funase[1,2]

[1]The University of Tokyo, [2]ISAS/JAXA, [3]NASA JPL

2022-d-68 (17:00 - 17:20)

Trajectory Design for the Hayabusa2 Extended Mission

*Takanao Saiki[1], Yuya Mimasu[1], Yuto Takei[1], Hiroshi Takeuchi[1], Kazutaka Nishiyama[1], Takaaki Kato[2], Yuichi Tsuda[1]

[1]Japan Aerospace Exploration Agency, [2]NEC Aerospace Systems,Ltd.

Session e-1) Mar 2 (Wed) 9:00 - 10:40 [Meeting Room3]

Re-entry Aerodynamics

Chairpersons: Hirotaka OTSU (Ryukoku University)
Hiroki TAKAYANAGI (JAXA)

2022-e-01 (9:00 - 9:20)

An All-in-One Unpowered Mars Rover integrated with EDL System

*Daisuke Akita[1]

[1]Tokyo Institute of Technology

2022-e-02 (9:20 - 9:40)

Rotational Motions of Axisymmetric Blunt Body in Different Degrees of Freedom

*Koju Hiraki[1], Masanori Sakai[1], Yu Handa[1], Harald Kleine[2]

[1]Kyushu Institute of Technology, [2]University of New South Wales

2022-e-03 (9:40 - 10:00)

Ablation Experiments of Porous Carbon-based Heat-resistant Materials in High-enthalpy Air Plasma Freejets

Yusuke Matsuoka[1], *Yuki Oya[1], Masato Funatsu[2]

[1]Department of Mechanical Science and Technology, School of Science and Technology, Gunma University,
[2]Division of Mechanical Science and Technology, Graduate School of Science and Technology, Gunma University

2022-e-04 (10:00 - 10:20)

Trajectory Reconstruction and Localization of Hayabusa2 SRC in Recovery Operation

*Tetsuya Yamada, Kosuke Kawahara, Satoru Nakazawa

JAXA

2022-e-05 (10:20 - 10:40)

Post-flight Analysis of Recovered Components of Hayabusa2 Sample Return Capsule

*Tetsuya Yamada, Keisuke Yoshihara

JAXA

Session e-2) Mar 2 (Wed) 11:00 - 12:00 [Meeting Room3]

Aerothermodynamics and Arc Jet

Chairpersons: Katsuyoshi FUKIBA (Shizuoka Universtiy)
Hiroyuki NISHIDA (Tokyo University of Agriculture and Technology)

2022-e-07 (11:00 - 11:20)

Assessment of a Centerline Enthalpy Determination Method of Arcjet Wind Tunnel Flow

*Kenichi Sakamoto[1], Yoichi Takagi[1], Kota Moriyama[1], Kaho Hayashi[1], Hiroshi Katsurayama[1], Toshiyuki Suzuki[2], Takeharu Sakai[1]

[1]Tottori University, [2]JAXA

2022-e-08 (11:20 - 11:40)

Laser Thomson Scattering Measurement around Magnetized Body in Rarefied Arc-Heated Argon Plume

*Kota Moriyama[1], Hiroki Sakaguchi[2], Hiroshi Katsurayama[1], Kentaro Tomita[3]

[1]Tottori Univ. Department of Mechanical and Aerospace Engineering, [2]Yamaguchi Univ. Department of Mechanical Engineering,
[3]Hokkaido Univ. Division of Quantum Science and Engineering

2022-e-09 (11:40 - 12:00)

Ionization Seed Addition Experiment for Magnetohydrodynamic Shock Layer Enlargement in Arc-Heated Flow

*Shiori Kusu[1], Hayato Iizuka[2], Hiroshi Katsurayama[1], Kenichi Sakamoto[1], Takeharu Sakai[1], Toshiyuki Suzuki[4], Makoto Matsui[3]

[1]Tottori Univ. Department of Mechanical and Aerospace Engineering, [2]Yamaguchi Univ. Department of Mechanical Engineering, [3]Sizuoka Univ. Department of Mechanical Engineering, [4]JAXA

Session e-3) Mar 2 (Wed) 16:00 - 17:00 [Meeting Room3]

High-enthalpy and Hypersonic Flow I

Chairpersons: Kojiro SUZUKI (The University of Tokyo)
Yasumasa WATANABE (The University of Tokyo)

2022-e-11 (16:00 - 16:20)

Development of an Evaluation Method for Sample Return Capsule Parachute using Numerical Analysis and Wind Tunnel Tests

*Ryota Samo[1], Hiroki Takayanagi[2], Riku Shinohara[1], Toshiyuki Suzuki[2], Shinjiro Umezu[1]

[1]Waseda Univ. Faculty of Science and Engineering, [2]Japan Aerospace Exploration Agency

2022-e-12 (16:20 - 16:40)

Attitude Motion of Deployable Aeroshell Capsule during Reentry Flight in Sounding Rocket Experiment

*Yasunori Nagata[1], Tatsuro Nakao[1], Hideto Takasawa[2], Koshiro Hirata[3], Kazuhiko Yamada[1]

[1]Japan Aerospace Exploration Agency, [2]Hokkaido University, [3]Tokyo University of Agriculture and Technology

2022-e-13 (16:40 - 17:00)

Assessment of Martian Real-Gas Aerodynamics by Free-Flight Test Facility

*Kyosuke ITABASHI[1], Satoshi NOMURA[2], Masahito MIZUNO[2], Kazuhisa FUJITA[2]

[1]The University of Tokyo, Department of Advanced Energy, [2]Japan Aerospace Exploration Agency, Aeronautical Technology Directorate

Session e-4) Mar 3 (Thu) 9:00 - 10:40 [Meeting Room3]

High-enthalpy and Hypersonic Flow II

Chairpersons: Makoto MATSUI (Shizuoka University)
Hiroshi Katsurayama (Tottori University)

2022-e-14 (9:00 - 9:20)

Three-dimensional Numerical Simulation of Hypersonic Flow over a Ramp : Effects of Angle of Attack on Shock Wave Structure

*Kalash Dixit, Kohei ozawa, Nobuyuki Tsuboi

Kyushu Institute of Technology

2022-e-15 (9:20 - 9:40)

Numerical Study toward Verification of Analogy between Hypersonic Turbulent Transition and Directed Percolation

*Yasuhito Okano, Shintaro Sato, Naofumi Ohnishi

Department of Aerospace Engineering, Tohoku University

2022-e-16 (9:40 - 10:00)

Hypersonic Boundary Layer Development on Tube Wall in Long-Distance Propagation of Shock Wave

*Hiroki Sakamoto, Shintaro Sato, Naofumi Ohnishi

Tohoku Univ. Department of Aerospace Engineering

2022-e-17 (10:00 - 10:20)

Study on the Interaction between Two Proximal Spherical Bodies in Hypersonic Flow

*Zipei Dong[1], Yasumasa Watanabe[2], Kojiro Suzuki[1]

[1]The University of Tokyo, Department of advanced energy , [2]The University of Tokyo, Department of Aeronautics and Astronautics

2022-e-18 (10:20 - 10:40)

Fundamental Study on Icing and Phase Change of Water along Compression and Expansion Surfaces in Mach-7 Hypersonic Flow

*Yasumasa Watanabe[1], Kojiro Suzuki[2]

[1]Department of Aeronautics and Astronautics, The University of Tokyo, [2]Department of Advanced Energy, The University of Tokyo

Session e-5) Mar 3 (Thu) 11:00 - 12:40 [Meeting Room3]

Plasma Flows

Chairpersons: Nobuyuki TSUBOI (Kyushu Institute of Technology)
Takashi MATSUNO (Tottori University)

2022-e-19 (11:00 - 11:20)

Aluminum Collection from Laser Ablated Al2O3 by Plume Cooling with Supersonic Nozzle

*Ryohei Oishi[1], Kazune Uesugi[1], Kanta Ishiguro[2], Makoto Matsui[1]

[1]Shizuoka University. Department of Engineering, [2]Shizuoka University. Department of Mechanical Engineering

2022-e-20 (11:20 - 11:40)

Pressure Dependency on Carbothermal Reduction Efficiency of Al2O3 by Laser Ablation under Methane Environment

*Kanta Ishiguro[1], Kazune Uesugi[2], Ryohei Oishi[2], Makoto Matsui[2]

[1]Shizuoka Univ. Department of Mechanical Engineering, [2]Shizuoka Univ. Department of Engineering

2022-e-21 (11:40 - 12:00)

Experimental and Numerical Study on Plasma-assisted Rapid Control of Flowfield around Nose of Hypersonic Transport

*Yasumasa Watanabe[1], Kojiro Suzuki[2]

[1]Department of Aeronautics and Astronautics, The University of Tokyo, [2]Department of Advanced Energy, The University of Tokyo

2022-e-22 (12:00 - 12:20)

Effect of External Flow Velocity on the Thermal Characteristics of Dielectric Barrier Discharge Plasma Actuator

*Asami Hatamoto, Kenta Emori, Hiroyuki Nishida

Tokyo University of Agriculture and Technology

2022-e-23 (12:20 - 12:40)

Towards Development of a Plasma Actuator without External Power Supply for Electric Cars and Aircraft

*Shintaro Sato, Naofumi Ohnishi

Tohoku University

Session e-6) Mar 3 (Thu) 16:00 - 17:40 [Meeting Room3]

Advanced Fluid Dynamics and Multi-phase Flow

Chairpersons: Keiichi Kitamura (Yokohama National University)
Naofumi OHNISHI (Tohoku University)

2022-e-24 (16:00 - 16:20)

Experimental Study of a Flow Multimeter for Gas-Liquid Two-Phase Flow Using Bidirectional Long Short-Term Memory Network

*Keigo Nakao[1], Mizuki Oinuma[1], Yukari Sakano[1], Takumi Miyase[1], Motohide Akutsu[1], Yuki Sakamoto[2], Tetsuya Sato[1]

[1]Department of Applied Mechanics and Aerospace Engineering, Waseda University,
[2]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency

2022-e-25 (16:20 - 16:40)

Asymmetrical unsteady flow field due to a supersonic impinging jet controlled by fluidic injectors

*Masahiro Kobayashi, Takahiro Ukai

Osaka Institute of Technology. Department of Mechanical Engineering

2022-e-26 (16:40 - 17:00)

The effects of time scale on the interaction between the pressure waveforms and turbulence

*Honami Nakagawa, Takahiro Ukai

Osaka Institute of Technology. Department of mechanical engineering

2022-e-27 (17:00 - 17:20)

Numerical Study of Cryogenic Hydrogen Jet in Crossflow under Supercritical Pressure: Effects of the Number of Injector Holes

*Tomohito Nakatsukasa[1], Amano Taishi[1], Takahide Araki[1], Hiroshi Terashima[2], Daiki Muto[3], Nobuyuki Tsuboi[1], Kohei Ozawa[1]

[1]Kyushu Institute of Technology, [2]The University of Hokkaido, [3]JAXA

2022-e-28 (17:20 - 17:40)

Prediction of Fuel Injection Flowfield in Scramjet Engine via Machine Learning

*Kento AKiyama, Hideaki Ogawa

Kyushu Univ. Department of Aeronautics and Astronautics

Session e-7) Mar 4 (Fri) 9:00 - 10:20 [Meeting Room3]

Aerodynamics I

Chairpersons: Makoto SATO (Kogakuin University)
MASAYUKI ANYOJI (Kyushu University)

2022-e-29 (9:00 - 9:20)

Modelling of Flight Dynamics of Wing-Tip-Chained Airplanes for Airborne Observation on Mars

*Yoichi Suenaga, Kojiro Suzuki

Department of Advanced Energy, Graduate School of Frontier Sciences, The University of Tokyo

2022-e-30 (9:20 - 9:40)

Visual Explanation of Flow Separation Control Strategy over an Airfoil Obtained in Deep Reinforcement Learning

*Naoki Takada, Tatsumasa Ishikawa, Satoshi Shimomura, Satoshi Sekimoto, Hiroyuki Nishida

Tokyo University of Agriculture and Technology

2022-e-31 (9:40 - 10:00)

Experimental and Numerical Study on Aerodynamic Instability of Thin Shell Type Reentry Capsule at Subsonic Speed

*Hideto Takasawa[1], Tomoya Fujii[2], Yusuke Takahashi[1], Yasunori Nagata[3], Kazuhiko Yamada[3], Hiroki Takayanagi[3]

[1]Hokkaido Univ. Faculty of engineering, [2]Waseda Univ. Faculty of Science and Engineering, [3]JAXA

2022-e-32 (10:00 - 10:20)

Basic Experiment on Calibration Method for Wind Tunnel Balance System at Cryogenic Temperature

*Masashi Kashitani[1], Masato Taguchi[1], Thai Duong Nguyen[1], Hiroaki Ono[2]

[1]National Defense Academy, [2]Formerly University of Tsukuba

Session e-8) Mar 4 (Fri) 11:00 - 11:40 [Meeting Room3]

Aerodynamics II

Chairpersons: Masashi Kashitani (National Defense Academy)
Masato Taguchi (National Defense Academy)

2022-e-33 (11:00 - 11:20)

Study on Water Vapor Distribution in Supersonic Flow Using TDLAS

*Ryota Ito[1], Yamato Kashiwagi[1], Shinya Nagasawa[1], Sadatake Tomioka[2]

[1]Tohoku University, [2]JAXA

2022-e-34 (11:20 - 11:40)

Extension of Applicable Flow Velocity Range for High-Speed Impinging Jet by Optical Flow Analysis

*Masato Hijikuro, Masayuki Anyoji

Kyushu Univ.

Session f-1) Feb 28 (Mon) 15:40 - 17:00 [Rehearsal Room]

Structures and Materials

Chairpersons: Hirokazu Masui (Kyushu Institute of Technology)
Yuji Sakamoto (Hokkaido University)

2022-f-01 (15:40 - 16:00)

Structural system of 6U satellite Ten-Koh 2 molded by 3D printing

*Taichi Murakami, Keiichi Okuyama, Rafael Rodriguez, Hideaki Hashimoto

College of Science and Technology, Nihon University

2022-f-02 (16:00 - 16:20)

Nanosatellite payload suite for in-orbit validation of spacecraft materials and systems

*Isai Fajardo, Keiichi Okuyama, Rafael Rodríguez, Ten-Koh 2 team

Nihon University

2022-f-03 (16:20 - 16:40)

Lessons Learned on Structure Design and Vibration Test for 50-kg Microsatellites Deployed from the International Space Station

*Yuji Sakamoto[1], Junichi Kurihara[1], Shinya Fujita[2], Yuji Sato[2], Toshinori Kuwahara[2]

[1]Hokkaido University, [2]Tohoku University

2022-f-04 (16:40 - 17:00)

Research on Vibration Control to Mitigate Mechanical Environment Inside Satellites

*Kentaro Shirai, Hironori Sahara

Tokyo Metropolitan Univ. Department of Aeronautics and Astronautics

Session f-2) Mar 1 (Tue) 9:20 - 10:40 [Rehearsal Room]

Missions and Future Capabilities 1

Chairperson: Hirokazu Masui (Kyushu Institute of Technology)

2022-f-05 (9:20 - 9:40)

The Detailed Design of the SOURCE Satellite for Demise Investigation

*Daniel Galla[1], Sabine Klinkner[1], Georg Herdrich[1], Clemens Kaiser[1], Hendrik Kuhm[2], Hendrik Fischer[2]

[1]Institute of Space Systems, University of Stuttgart, [2]Small Satellite Student Society at the University of Stuttgart

2022-f-06 (9:40 - 10:00)

Transparent S-band patch array antenna for a lunar mission CubeSat

*Daisuke Nakayama, Mengu Cho

Kyushu Institute of Technology

2022-f-07 (10:00 - 10:20)

Development of Osaka Sangyo University 1U Cubesat OSU-1 with 1J/1W Pulsed Plasma Thruster Systems for Powered Flight, and R&D Project Features of Nano-Satellite & Probe OSU-2, 3 and 4

*Kazuki Aoyagi[1], Tomoya Shimada[1], Takuma Unegawa[1], Maika Uedahira[1], Ken-ichiro Oka[2], Tomonori Kimura[2], Takayuki Kuri[2], Kenshin Motoe[2], Takahiro Itsuki[3], Hirokazu Tahara[1], Tomoyuki Ikeda[4], Yoshiyuki Takao[5], Takashi Wakizono[6]

[1]Osaka Sangyo University, Department of Mechanical Engineering , [2]Osaka Sangyo University, Solar System Space Development Project, [3]Osaka Sangyo University, Graduate School of Engineering, Division of Mechanical Engineering, [4]Tokai University, [5]Nishinippon Institute of Technology, [6]High Serve, Inc.

2022-f-09 (10:20 - 10:40)

Development of 2U satellite "MITSUBA" for Orbit Demonstration of Commercial Components

*Hirokazu Masui, Isami Kato, MITSUBA project, Mengu Cho

Kyushu Institute of Technology

Session f-3) Mar 1 (Tue) 11:00 - 12:40 [Rehearsal Room]

Missions and Future Capabilities 2

Chairperson: Norihide Miyamura (Meisei University)

2022-f-10 (11:00 - 11:20)

Development of a Double Langmuir Probe that can be Mounted on a Nano-Satellite

*Kohei Kamitani, Hirokazu Masui, Mengu Cho

Kyushu Institute of Technology

2022-f-11 (11:20 - 11:40)

Alignment and Wavefront Correction for the Formation Flying Synthetic Aperture Telescope (FFSAT)

*Norihide Miyamura[1], Ryo Suzumoto[2], Satoshi Ikari[2], Shinichi Yokobori[2], Shinichi Nakasuka[2]

[1]Meisei University, [2]The University of Tokyo

2022-f-12 (11:40 - 12:00)

AIV challenges under the WiPTherm project: Hybrid Power Harvesting System for a 3U CubeSat

Fernando Aguado Agelet[1], *Fermín Navarro Medina[2], Carlos Ulloa Sande[2], Pedro Orgeira Crespo[2], Guillermo Rey González[2], Alejandro Manuel Gómez San Juan[2], Uxia Garcia Luis[2], Vlad Dragos Darau[1], Alejandro Camanzo Mariño[1]

[1]University of Vigo, ETSE Telecomunicación, Spain, [2]University of Vigo, Escuela de Ingeniería Aeronáutica y del Espacio, Spain

2022-f-13 (12:00 - 12:20)

Ten-Koh 2 Spacecraft and Its Missions

*Keiichi Okuyama, Rafael Armando Rodriguez Leon, Isai Fajardo Tapia, Ten-Koh 2 Team

Nihon University, College of Science and Technology, Department of Aerospace Engineering

2022-f-14 (12:20 - 12:40)

Development of the Whisker Verification Experiment Satellite "FUTABA"

*Akihiro Oboshi, Mengu Cho, Hirokazu Masui

Kyushu Institute of Technology

Session f-4) Mar 1 (Tue) 16:00 - 17:00 [Rehearsal Room]

Mission Results and Lessons Learned

Chairperson: Toshinori Kuwahara (Tohoku University)

2022-f-16 (16:00 - 16:20)

Advancing National Space Capabilities: From a CubeSat to a MicroSat. Small satellites for Sustainable Development

*Kasia Clatworthy, Alex Da Silva Curiel, Martin Sweeting, Emma Turnbull

Surrey Satellite Technology Ltd

2022-f-18 (16:20 - 16:40)

Revival and Successive Operation of 3U CubeSat OrigamiSat-1 with Multifunctional Deployable Membrane

*Shuhei Koike[1], Motoki Moritani [1], Misato Ishiwata [1], Shinya Tamura[1], Kazuki Nagai [1], Hiraku Sakamoto[1], Hiroki Nakanishi[1], Takashi Tomura[1], Hiroshi Furuya [1], Akihito Watanabe[2]

[1]Tokyo Institute of Technology, [2]Sakase Adtech, Co., Ltd.

2022-f-19 (16:40 - 17:00)

Lessons Learned of International Scientific Micro-satellite RISESAT

*Toshinori Kuwahara[1], Shinya Fujita[1], Yuji Sato[1], Yuji Sakamoto[2], Junichi Kurihara[2]

[1]Tohoku University, [2]Hokkaido University

Session f-5) Mar 2 (Wed) 9:20 - 10:40 [Rehearsal Room]

Remote Sensing Missions and Technologies

Chairperson: Kazumasa Imai (National Institute of Technology, Kochi College)

2022-f-20 (9:20 - 9:40)

Mission introduction of ONGLAISAT (ONboard Globe-Looking AI Satellite)

*Chen-Yu Chan[1], Nuan-Ya Huang[1], Jie-Rou Shang[1], Albert Lin[1], Jer Ling[1], Akihiro Ishikawa[2], Toshihiro Shibukawa[2,3], Ryo Suzumoto[2,3], Masahiro Fujiwara[2], Hirotaka Kondo[2], Toshio Imamura[2], Taiki Karakawa[2], Kenta Suda[2], Tomotaka Yamamoto[2], Yoshinari Gyu[2], Ryuichi Hirayama[2], Yosuke Kawabata[2], Satoshi Ikari[2], Ryu Funase[2], Shinichi Nakasuka[2]

[1]National Space Organization (NSPO), [2]The University of Tokyo, [3]ArkEdge Space Inc., Japan

2022-f-21 (9:40 - 10:00)

Development of KITSUNE: A 6U CubeSat for 5-m Class Imaging, C-band Radio Service, Ionospheric Research and IoT

*NECMI CIHAN ORGER[1], Jose Rodrigo Cordova-Alarcon[1], Victor Hugo Schulz[1], Tharindu Dayarathna[1,2], Takashi Yamauchi[1], Hirokazu Masui[1], Joseph Ampadu Ofosu[1], Sangkyun Kim[1], Mariko Teramoto[1], Pooja Leepcha[1], Daisuke Nakayama[1], Marloun Pelayo Sejera[1], Muhammad Hasif Bin Azami[1], Makiko Kishimoto[1], Chee Lap Chow[3], King Ho Li Holden[3], Hirotoshi Harada[4], Yoshiya Fukuda[4], Kaname Kojima[5], Mengu Cho[1]

[1]Laboratory of Lean Satellite Enterprises and In-Orbit Experiments, Kyushu Institute of Technology, [2]ACCIMT, [3]Nanyang Technological University, [4]Harada Seiki Co. Ltd, [5]ADDNICS Corp

2022-f-22 (10:00 - 10:20)

Statistical Evaluation of Seismic Precursors by Artificial VLF radio waves using on-orbit Data

*Tomoyuki Iida[1], Masahiko Yamazaki[1], Masashi Kamogawa[2]

[1]Nihon Univ. Graduate School of Science and Technology Department of Aerospace Engineering, [2]Division for Earthquake Prediction Research, Global Center for Asian and Regional Research, University of Shizuoka

2022-f-23 (10:20 - 10:40)

Technology Demonstration CubeSat KOSEN-1 for Jupiter Radio Observations

*Kazumasa Imai[1], Nobuto Hirakoso[2], Masanori Nishio[3], Taku Takada[4], Kentaro Kitamura[5], Jun Nakaya[6], Yukikazu Murakami[7], Masahiro Tokumitsu[8], Masafumi Imai[9], Kan Fukai[10]

[1]National Institute of Technology, Kochi College, [2]National Institute of Technology, Gunma College, [3]Aichi Univ. of Technology, [4]Tokyo Metropolitan College of Industrial Technology , [5]Kyushu Institute of Technology, [6]National Institute of Technology, Gifu College, [7]National Institute of Technology, Kagawa College, [8]National Institute of Technology, Yonago College, [9]National Institute of Technology, Niihama College, [1]. Microwave Factory

Session f-6) Mar 2 (Wed) 11:00 - 12:20 [Rehearsal Room]

NSAT&LCPM Joint Session: Lunar and Interplanetary Missions

Chairpersons: Shintaro Nakajima (Institute of Space and Astronautical Science JAXA)
Toshinori Kuwahara (Tohoku University)

2022-f-25 (11:00 - 11:20)

SEIMEI: Mission to search for life on Enceladus via small satellite with solar power sail

*Maximilien BERTHET, Jorge Alberto GARCIA PEREZ, Kentaro ENOKIDA, Luciana TENORIO, Rashmi RAJ

Department of Aeronautics and Astronautics, The University of Tokyo, Japan

2022-f-26 (11:20 - 11:40)

Folding, Deploying and Controlling the Payankeu Solar Sailcraft

*Guy Pignolet[1], Pierre Munoz[1], Varinka Ponamale[1], Alain Perret[2], Junichiro Kawaguchi[3], Kenji Ogimoto[4]

[1]Reunion Island Space Initiative, [2]U3Solar Sail Association, [3]Kawaguchi Lab, [4]Souki Research Institute

2022-f-27 (11:40 - 12:00)

System Design of Interplanetary Microsatellite with High Thrust Propulsion System

*Shintaro Nakajima[1], Yosuke Kawabata[2], Tomotaka Yamamoto[2], Kazuma Fujimoto[2], Akihiro Ishikawa[2], Ryu Funase[1,2]

[1]Institute of Space and Astronautical Science, JAXA, [2]The University of Tokyo

2022-f-28 (12:00 - 12:20)

A Micro/Nano Satellite Mission Idea Contest for Deep Space Science and Exploration - Results and Future perspectives

*Rei Kawashima[1], Naoya Ozaki[2], Herman Steyn[3], Munetaka Ueno[2,4], Ryu Funase[5], Rainer Sandau[6], Rene Laufer[7], Martin Sweeting[8], Shinichi Nakasuka[5], Nate Taylor[1]

[1]UNISEC-Global, [2]ISAS/JAXA, [3]Stellenbosch University, [4]Kobe University, [5]University of Tokyo, [6]International Academy of Astronautics (IAA), [7]Lulea University of Technology, [8]Surrey Satellite Technology Limited (SSTL)

Session f-7) Mar 2 (Wed) 16:00 - 17:00 [Rehearsal Room]

Flight Dynamics and Navigation

Chairperson: Yuji Sakamoto (Hokkaido University)

2022-f-29 (16:00 - 16:20)

Magnetic Plasma Drag Demonstration Mission for Nanosatellite Orbit Control

*Ji Hyun Park[1], Takaya Inamori[1], Hiroaki Masuda[1], Kiyoshi Kinefuchi[1], Rei Kawashima[2], Kohei Yamaguchi[1]

[1]Nagoya University, Department of Aerospace Engineering, [2]The University of Tokyo, Department of Aeronautics and Astronautics

2022-f-31 (16:20 - 16:40)

Development of an Autonomous Soft Docking of Small Spacecraft using Visual Guidance Saving Computational Cost and Hardware Resources

*Asumi Nishimura, Katsuyoshi Tsujita

Osaka Institute of Technology, Dept. of Electrical and Electronic Systems Engineering

2022-f-32 (16:40 - 17:00)

Systematization of Microsatellite-Friendly Multi-Purpose Propulsion System

*Hiroyoshi Yasuhira[1], Ryusei Hayatomo[1], Kazuki Hirayama[1], Haruki Sashida[1], Kohdai Ono[1], Takuto iijima[1], Hironori Sahara[1], Takeru Yuzawa[2], Yuya Ikeda[2], Toshiaki Iizuka[2], Daisuke Suzuki[3]

[1]Tokyo Metropolitan University, [2]National Institute of Technology, Oyama College, [3]ALE Co., Ltd

Session f-8) Mar 3 (Thu) 9:40 - 10:40 [Rehearsal Room]

Formation/Constellation Management

Chairperson: Satoshi Ikari (The University of Tokyo)

2022-f-34 (9:40 - 10:00)

Initial Result of High-precision Control Experiments with Optical System for Synthetic Aperture Telescope Using Formation Flying Micro-satellites

*Ryo Suzumoto[1], Norihide Miyamura[2], Satoshi Ikari[1], Shinichi Yokobori[1], Shinichi Nakasuka[1]

[1]The University of Tokyo, [2]Meisei University

2022-f-35 (10:00 - 10:20)

A Geolocation Technique Based on TOA and FOA in LEO Satellite-based Wireless Positioning

*Ko-Yen Hsu, Jyh-Ching Juang

Department of Electrical Engineering, National Cheng Kung University, Taiwan. Rm. 92875., 8F., EE building, No.1Daxue Rd., East Dist., Tainan City 70101Taiwan.

2022-f-36 (10:20 - 10:40)

Propellant-less formation flight with momentum exchange of jointed multiple Cubesats in the MAGNARO mission

*Takaya Inamori, JiHyun Park, Yuki Yamada, Truong An Hoang Xuan, Xinbo Gu, Keita Nagai

Nagoya University, Department of Aerospace Engineering

Session f-9) Mar 3 (Thu) 11:00 - 12:40 [Rehearsal Room]

Attitude Determination and Control

Chairperson: Satoshi Ikari (The University of Tokyo)

2022-f-37 (11:00 - 11:20)

Experiment/Simulation-Based Assessment of Microvibration-Induced Pointing Error in 6U Class CubeSat Missions

*Takayuki Hosonuma[1], Satoshi Ikari[1], Toshihiro Suzuki[1], Toshio Imamura[1], Masahiro Fujiwara[1], Hirotaka Sekine[1], Naoto Usami[1], Ryohei Takahashi[1], Yoshihide Shimada[2], Hirokazu Nakamura[2], Shinichi Yokobori[1], Ryuichi Hirayama[1], Tatsuya Arai[1], Kazuki Toma[1], Akihiro Ishikawa[1], Shuhei Matsushita[1], Ryu Funase[1], Shinichi Nakasuka[1]

[1]The University of Tokyo, [2]Seiren Co., Ltd

2022-f-38 (11:20 - 11:40)

Analysis of Dzhanibekov Effect and Inertia Morphing in CubeSat Attitude Control

*Jyh-Ching Juang, Arvin Tan

National Cheng Kung University

2022-f-39 (11:40 - 12:00)

Flight Model Development and Ground Tests of Variable-Shape Attitude Control Demonstration MicroSatellite HIBARI

*Kei Watanabe, Hiroyuki Kobayashi, Yuki Amaki, Naoki Kawaguchi, Soichi Sato, Kenichiro Takahashi, Fumitaka Sagawa, Shogo Nerome, Kiyona Miyamoto, Yuta Sasagawa, Yoichi Yatsu, Toshihiro Chujo, Saburo Matunaga, HIBARI Development Team

Tokyo Institute of Technology

2022-f-40 (12:00 - 12:20)

Attitude determination and control system for the 6U CubeSat KITSUNE

*Jose Rodrigo Cordova Alarcon, Adolfo Javier Jara-Cespedes, Dulani Chamika Withanage, Victor Hugo Schultz, Necmi Cihan Orger, Sangkyun Kim, Mengu Cho

Kyushu Institute of Technology

2022-f-41 (12:20 - 12:40)

Development of Compact and Highly Capable Integrated AOCS Module for CubeSats

*Satoshi Ikari[1,4], Takayuki Hosonuma[1], Toshio Imamura[1], Toshihiro Suzuki[1], Masahiro Fujiwara[1], Hirotaka Sekine[1], Naoto Usami[1], Ryohei Takahashi[1,4], Hajime Arai[2], Yoshihide Shimada[2], Hirokazu Nakamura[2], Ryo Suzumoto[1,4], Toshihiro Shibukawa[1,4], Shuhei Matsushita[1,4], Akihiro Ishikawa[1], Takayoshi Fukuyo[4], Ryu Funase[1,3], Shinichi Nakasuka[1]

[1]The University of Tokyo, [2]Seiren Co., Ltd., [3]ISAS, JAXA, [4]ArkEdge Space Inc.

Session f-10) Mar 3 (Thu) 16:00 - 17:40 [Rehearsal Room]

Operations Automation and Optimization

Chairperson: Junichi Kurihara (Hokkaido University)

2022-f-42 (16:00 - 16:20)

Space-camera Artificial Intelligence Mission for Image Data Prioritization

*Ji Hyun Park[1], Takaya Inamori[1], Takatomo Osaki[1], Ryuhei Hamaguchi[2], Kensuke Otsuki[3]

[1]Nagoya University, Department of Aerospace Engineering, [2]PASCO CORPORATION, [3]NTT DATA Mathematical Systems Inc.

2022-f-43 (16:20 - 16:40)

Construction of Hazard Analysis for Resilient Operation of Nano-Satellite

*Masafumi Yamada, Nozomu Kogiso

Osaka Prefecture Univ. Department of Aerospace Engineering

2022-f-44 (16:40 - 17:00)

Comparison Study of Machine Learning Methods for CubeSat Anomaly Detection

*Adolfo Jara, Bramandika Holy Bagas Pangestu, Akitoshi Hanazawa, Mengu Cho

Kyushu Institute of Technology. Department of Engineering

2022-f-45 (17:00 - 17:20)

Anomaly Detection for Multiple Satellite System using Machine Learning

*XINYU YANG, Shun Katsube, Hironori Sahara

Tokyo Metropolitan University,Department of Aeronautics and Astronautics

2022-f-46 (17:20 - 17:40)

Satellite Data Manager for Data Management of Earth Observation Microsatellites

*Junichi Kurihara[1], Yuji Sakamoto[2], Yuji Sato[3], Shinya Fujita[3], Toshinori Kuwahara[3]

[1]Hokkaido University, Faculty of Science, [2]Hokkaido University, Faculty of Engineering,
[3]Tohoku University, Department of Aerospace Engineering

Session f-11) Mar 4 (Fri) 10:00 - 10:40 [Rehearsal Room]

Integrating Space and Ground Observations

Chairpersons: Kikuko Miyata (Meijo University)
Junichi Kurihara (Hokkaido University)

2022-f-47 (10:00 - 10:20)

Design of Low Power Wide Area-network via Small Flying Objects Constellation

*Kikuko Miyata[1], Takeshi Matsumoto[2,3], Shinichi Nakasuka[3]

[1]Meijo University, [2]ArkEdge Space, [3]The University of Tokyo

2022-f-49 (10:20 - 10:40)

Conceptual Design of Telemetry & Command system enhanced by LPWA for 6U "ONGLAISAT"

Takeshi Matsumoto[1,3], *Tomotaka Yamamoto[1], Naoto Usami[1,2], Kota Kakihara[1,3], Yosuke Kawabata[1], Do Xuan Phong[1], Kentaro Enokida[1], Tomoki Mochizuki[1], Charleston Dale M. Ambatali[1], Kanta Yanagida[1,3], Takayoshi Fukuyo[1,3], Akihiro Ishikawa[1], Ryu Funase[1], Shinichi Nakasuka[1]

[1]The University of Tokyo. Department of Aeronautics and Astronautics., [2]JAXA, Japan, [3]ArkEdge Space inc., Japan

Session f-12) Mar 4 (Fri) 11:00 - 12:40 [Rehearsal Room]

Satellite Design and Development 1

Chairperson: Kikuko Miyata (Meijo University)

2022-f-50 (11:00 - 11:20)

Flexible 6U CubeSat Bus System and its Efficient Production and Operation System for Various Constellation Missions

*Shuhei Matsushita, Akihiro Ishikawa, Kota Kakihara, Toshihiro Shibukawa, Ryo Suzumoto, Ryohei Takahashi, Masanobu Tsuji, Nobuhiro Funabiki, Takeshi Matsumoto, Kanta Yanagida, Quentin Verspieren, Satoshi Ikari, Takayoshi Fukuyo

ArkEdge Space Inc.

2022-f-51 (11:20 - 11:40)

Development of Flexible 3U CubeSat Structural Platform for Mass Production Applications

*Eyoas Ergetu Areda[1,2], Takashi Yamauchi [1], Cordova Rodrigo [1], Masui Hirokazu [1], Mengu Cho[1]

[1]Kyushu Institute of Technology, Department of Electrical and Space Engineering, [2]Ethiopian Space Science and Technology Institute

2022-f-52 (11:40 - 12:00)

Adaptability and Scalability of Configurable Interface Board for Different CubeSat Platforms and Missions

*Marloun Sejera, Takahashi Yamauchi, Yukihisa Otani, Mengu Cho

Kyushu Institute of Technology

2022-f-53 (12:00 - 12:20)

Scalability of Kyutech Standardized Electrical Power System for Lean satellites

*Pooja Lepcha, Tharindu Dayarathna, Victor Hugo Schulz, Necmi Cihan Orger, Jose Rodrigo Cordova-Alarcon, Hari Ram Shrestha, Sangkyun Kim, Takashi Yamauchi, Hirokazu Masui, Mengu Cho

Laboratory of Lean Satellite Enterprises and In-Orbit Experiments, Kyushu Institute of Technology

2022-f-54 (12:20 - 12:40)

To Develop a Standardized Back Plane Board Based on the BIRDS Satellites

*Yukihisa Otani, Mengu Cho, Sangkyun Kim, Takashi Yamauchi, Marloun Pelayo Sejera

Kyushu Institute of Technology

Session f-13) Mar 4 (Fri) 16:00 - 17:20 [Rehearsal Room]

Satellite Design and Development 2

Chairperson: Yuji Sakamoto (Hokkaido University)

2022-f-55 (16:00 - 16:20)

Comprehensive Power Balance Analysis under Various Operational Conditions for CubeSats

*Kazuma Fujimoto[1], Nobuhiro Funabiki[1], Kenta Suda[1], Morito Katsuyama[1], Kazuki Takashima[1], Keidai Iiyama[1], Akihiro Ishikawa[1], Shuhei Matsushita[1], Satoshi Ikari[1], Ryu Funase[1,2], Shinichi Nakasuka[1]

[1]The University of Tokyo, [2]Institute of Space and Astronautical Science (ISAS), JAXA

2022-f-56 (16:20 - 16:40)

Development of a Function-Oriented Flight Software Framework for CubeSats

*Yun-Rong Yang, Jyh-Ching Juang

Department of Electrical Engineering, National Cheng Kung University, Tainan, Taiwan

2022-f-57 (16:40 - 17:00)

Strategy of CubeSat Electrical Interface Design for Comprehensive Management and Efficient Verification

*Taiki Karakawa, Nobuhiro Funabiki, Kota Kakihara, Akihiro Ishikawa, Kenta Suda, Kazuma Fujimoto, Ryuichi Hirayama, Kazuki Toma, Shuhei Matsushita, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

2022-f-58 (17:00 - 17:20)

Improvement of C2A (Command-Centric Architecture) Reusability for Multiple Types of OBCs and Development of Continuous Integration Environment for Reliability of Flight Software

*Ryo Suzumoto, Kanta Yanagida, Taiki Karakawa, Yoshinari Gyu, Yutaro Ito, Akihiro Ishikawa, Satoshi Ikari, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

Session g-1) Mar 4 (Fri) 9:00 - 10:20 [Conference Room]

Reusable Launch Vehicles (RLVs) 1

Chairpersons: Kazuhiro Yagi (IHI Aerospace Co.,Ltd)
Takahiro Fujikawa (Tokyo University of Science)

2022-g-01 (9:00 - 9:20)

Numerical Analysis on Axial Force Characteristics of Reusable Launch Vehicle during Return Phase

*Tomohiro Mamashita[1], Tomotaro Muto[2], Keiichi Kitamura[1], Satoshi Nonaka[3]

[1]Yokohama National University, [2]The University of Tokyo, [3]JAXA (Japan Aerospace Exploration Agency)

2022-g-03 (9:20 - 9:40)

Flowfield visualization and mechanism of dynamic derivatives of a small-scale supersonic flight experiment vehicle being developed at Muroran Institute of Technology

*Shuuta Haraguchi[1], Shun Sasaki[2], Atsuya Honda[1], Ryuto Kawanabe[2], Haruka Nikado[2], Kazuhide Mizobata[3]

[1]Graduate student, Muroran-IT, [2]Undergraduate student, Muroran-IT, [3]Aerospace Plane Researth Center, Mutoran-IT

2022-g-04 (9:40 - 10:00)

Drag Reduction of the Small-scale Supersonic Flight Experiment Vehicle Being Developed at Muroran Institute of Technology (Third Report)

*Tomohiro Shigekiyo[1], Nana Hasegawa[2], Katsuya Miyamoto[1], Kazuhide Mizobata[3]

[1]Graduate student, Muroran-IT, [2]Undergraduate student, Muroran-IT, [3]Aerospace Plane Research Center, Muroran-IT

2022-g-05 (10:00 - 10:20)

Mach 5 Flight Experiment Plan of High-Mach Integrated Control Experimental Aircraft (HIMICO)

*Hideyuki Taguchi[1], Tetsuya Sato[2], Mitsuhiro Tsue[3], Takeshi Tsuchiya[3], Akiko Matsuo[4], Asei Tezuka[2], Shinji Nakaya[3], Takahiro Fujikawa[5], Naoto Morita[3], Tomonari Hirotani[1], Shunsuke Imamura[1], Hidemi Takahashi[1], Junichi Oki[1]

[1]Japan Aerospace Exploration Agency, [2]Waseda University, [3]The University of Tokyo, [4]Keio University, [5]Tokyo University of Science

Session g-2) Mar 4 (Fri) 11:00 - 12:00 [Conference Room]

Reusable Launch Vehicles (RLVs) 2

Chairpersons: Kazuhide Mizobata (Muroran Institute of Technology)
Shinji Ishimoto (JAXA)

2022-g-07 (11:00 - 11:20)

A Study on Increase of Down Range and Cross Range of Small Scale Fully Reusable Launch Vehicle with Morphing Technology

*Shigeru Aso[1], Masayuki Katayama[1], Yasuhiro Tani[2]

[1]Kurume Institute of Technology, [2]Sojo University

2022-g-09 (11:20 - 11:40)

Attitude Control Design for Launch Vehicle with Time-Varying Characteristics

*Emi Sakaoka

The Graduate University for Advanced Studies

2022-g-10 (11:40 - 12:00)

Particle Motion due to a Surface Shape in Jet-particle Interaction

*Rika Hata, Takahiro Ukai

Osaka institute of technology Department of Mechanical Engineering

Session g-3) Mar 4 (Fri) 16:00 - 18:00 [Conference Room]

Reusable Launch Vehicles (RLVs) 3

Chairpersons: Koki Kitagawa (Kyushu Institute of Technology)
Wataru Sarae (JAXA)

2022-g-12 (16:00 - 16:20)

Development Status of CALLISTO

*Shinji Ishimoto[1], Michel Illig[2], Etienne Dumont[3]

[1]JAXA, [2]CNES, [3]DLR

2022-g-13 (16:20 - 16:40)

CALLISTO: towards Reusability of a Rocket Stage: Current Status

*Etienne Dumont[1], Shinji Ishimoto[2], Michel Illig[3], Marco Sagliano[1], Marco Solari[1], Tobias Ecker[4], Hauke Martens[1], Sven Krummen[1], Jean Desmariaux[3], Yasuhiro Saito[2], Moritz Ertl[4], Josef Klevanski[5], Bodo Reimann[6], Svenja Woicke[1], Rene Schwarz[1], David Seelbinder[1], Markus Markgraf[7], Johannes Riehmer[5], Benjamin Braun[7], Moritz Aicher[7]

[1]Institute of Space Systems, DLR, Bremen, Germany, [2]Research and Development Directorate, JAXA, Tsukuba, Japan, [3]Launcher directorate, CNES, Paris, France, [4]Institute of Aerodynamics and Flow Technology, DLR, Gottingen, Germany, [5]Institute of Aerodynamics and Flow Technology, DLR, Cologne, Germany, [6]Institute of Aerodynamics and Flow Technology, DLR, Brunswick, Germany, [7]Space Operations and Astronaut Training, DLR, Oberpfaffenhofen, Germany

2022-g-14 (16:40 - 17:00)

Development of Reusable Structures and Mechanisms for CALLISTO

*Sofia Giagkozoglou Vincenzino[1], Silas Eichel[1], Waldemar Rotarmel[1], Felix Krziwanie[1], Ivaylo Petkov[1], Etienne Dumont[2], Anton Schneider[2], Silvio Schroder[2], Jens Windelberg[3], Tobias Ecker[4], Moritz Ertl[4]

[1]Institute of Structures and Design, DLR Stuttgart, Germany, [2]Institute of Space Systems, DLR Bremen, Germany, [3]Institute of Flight Systems, DLR Braunschweig, Germany, [4]Institute of Aerodynamics and Flow Technology, DLR Gottingen, Germany

2022-g-15 (17:00 - 17:20)

CALLISTO Avionics Development and Avionics Validation Facility

*Pascal TATIOSSIAN[1], Laurent MILLET-LACOMBE[2], Nobuyuki IIZUKA[3], Janis Sebastian HASEKER[4], Rene SCHWARZ[4], Christian GRIMM[4]

[1]Space Transportation Directorate, CNES, France, [2]ArianeGroup SAS, Les Mureaux, France, [3]Tsukuba Space Center, JAXA, Japan, [4] Institute of Space Systems, German Aerospace Center (DLR), Bremen, Germany

2022-g-16 (17:20 - 17:40)

Design and Development Status of Experiment Winged Rocket WIRES#015

*Daiki Fukushima[1], Koichi Yonemoto[1], Takahiro Fujikawa[1], Takahiro Matsukami[1], Tsuyoshi Otsuki[1], Yuto Kitazono[1], Yasuhiro Koshida[1], Masaaki Murakami[1], Tomotaka Watanabe[1], Hina Atarashi[1], Hidetoshi Takeyama[1], Shintaro Tejika[1], Yuito Fujii[1], Raizo Matsuda[1], Yusuke Mine[1], Ayaka Yamazaki[1], Sho Yoshida[1], Toshiki Morito[2]

[1]Space System Laboratory at Tokyo University of Science. Department of Mechanical Engineering. Faculty of Science and Technology. , [2]Japan Aerospace Exploration Agency (JAXA), Japan

2022-g-17 (17:40 - 18:00)

Application of Multidisciplinary Design Optimization to Preliminary Design of Suborbital Spaceplane

*Takahiro Fujikawa[1], Koichi Yonemoto[1,2]

[1]Tokyo University of Science, Department of Mechanical Engineering, [2]SPACE WALKER Inc.

Session h-1) Mar 1 (Tue) 9:00 - 10:00 [Meeting Room1]

Microgravity Sciences

Chairperson: TBD

2022-h-01 (9:00 - 9:20)

Numerical Investigation on the Effect of Droplet Interaction on Cool-flame Characteristics of n-Decane Droplet Pairs

*Shion Ando, Kenshin Koyama, Osamu Moriue

Kyushu Univ. Faculty of Engineering

2022-h-02 (9:20 - 9:40)

Extinction Limit of Opposed Flow Flame Propagating on PMMA Rods

*Hiroto Toda, Shinji Nakaya, Mitsuhiro Tsue

Department of Aeronautics and Astronautics, The University of Tokyo

2022-h-03 (9:40 - 10:00)

Thermophysical property measurements of high temperature melts using the Electrostatic Levitation Furnace in the International Space Station (ISS-ELF)

*Rina Shimonishi, Takehiko Ishikawa, Chihiro Koyama, Chihiro Kurosawa, Hirokazu Takeuchi, Shinsuke Kuroda, Hirohisa Oda, Tsuyoshi Ito

JAXA

Session h-2) Mar 1 (Tue) 11:00 - 11:40 [Meeting Room1]

Microgravity Technology

Chairperson: TBD

2022-h-05 (11:00 - 11:20)

Scattering Tendency of a Surface Object during Thrusting in the Vicinity of a Celestial Body

*Maiko Yamakawa[1], Yusuke Maru[2], Mitsuhisa Baba[2], Yu Daimon[2], Kazuhisa Fujita[2], Shujiro Sawai[1,2], Osamu Mori[2], Yuichi Tsuda[2]

[1]SOKENDAI, the Graduate University for Advanced Studies, [2]Japan Aerospace Exploration Agency

2022-h-07 (11:20 - 11:40)

WICOnet: An Ultra-Wideband Wireless Sensor Network for the ISS Columbus Laboratory

Christian Strowik, *Andre Luebken, Martin Drobczyk, Niklas Aksteiner

German Aerospace Center (DLR)

Session i-1) Mar 3 (Thu) 16:00 - 17:40 [Meeting Room32]

Thermal Control 1

Chairpersons: Hosei Nagano (Nagoya University)
Tsuyoshi Totani (Hokkaido Univ)

2022-i-01 (16:00 - 16:20)

Thermal Control System to easily cool GAPS Balloon-borne Instrument on the Ground

*Hideyuki Fuke[1], Shun Okazaki[1], Akiko Kawachi[2], Shohei Kobayashi[2], Masayoshi Kozai[3], Hiroyuki Ogawa[1], Masaru Saijo[1], Shuto Takeuchi[4], Kakeru Tokunaga[1]

[1]JAXA, [2]Tokai University, [3]ROIS, [4]Aoyama Gakuin University

2022-i-02 (16:20 - 16:40)

Effect on Startup Characteristics for Evaporator Preheating of Capillary Pumped Loop

*Masaru Hirata[1], Kimihide Odagiri[2], Hiroyuki Ogawa[2]

[1]The University of Tokyo, [2]Japan Aerospace Exploration Agency

2022-i-03 (16:40 - 17:00)

Thermal Effects of Aluminum-Copper-Aluminum Clad Material for the Utilization of the Entire Heat Capacity of Microsatellites

Kei Yoshii, *Tsuyoshi Totani

Hokkaido University

2022-i-04 (17:00 - 17:20)

Thermal Design Approach for CubeSats Utilizing a Standard Versatile Bus System

*Toshihiro Shibukawa, Shingo Nishimoto, Shuhei Matsushita, Shinichi Yokobori, Kazuki Takashima, Akihiro Ishikawa, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

2022-i-05 (17:20 - 17:40)

Performance Evaluation of Thermoelectric Device for Thermal Vacuum Testing of Nanosatellites

*Joseph Ampadu Ofosu[1,2], Hirokazu Masui[1,2], Mengu Cho[1]

[1]Kyushu Institute of Technology, [2]Center for Nanosatellite Testing

Session i-2) Mar 4 (Fri) 9:00 - 10:00 [Meeting Room32]

Thermal Control 2

Chairpersons: Tsuyoshi Totani (Hokkaido Univ)
Hosei Nagano (Nagoya University)

2022-i-06 (9:00 - 9:20)

Feasibility Study on Thermal Design of Optical System for Synthetic Aperture Telescope Using Formation Flying Micro-satellites

*Shinichi Yokobori[1], Ryo Suzumoto[1], Norihide Miyamura[2], Satoshi Ikari[1], Shinichi Nakasuka[1]

[1]The University of Tokyo, [2]Meisei University

2022-i-07 (9:20 - 9:40)

Thermal Design of 6U Satellite KITSUNE Equipped with a High-Resolution Camera

*Takashi Oshiro[1], Mengu Cho[1], Hirokazu Masui[1], Takashi Yamauchi[1], Muhammad Hasif Bin Azami[1], Necmi Cihan Orger[1], Kazuhiro Nakayama[2]

[1]Kyushu Institute of Technology, [2]Harada Seiki

2022-i-08 (9:40 - 10:00)

Thermal Control of Array Antenna Transmitters Attached on Space Membrane Structures

*Yuki Takeda[1], Shinji Takeda[1], Shuhei Koike[1], Masahiro Fujita[2], Yuta Takahashi[1], Motoki Moritani[1], Haruki Hagiwara[1], Dongwon You[1], Atsushi Shirane[1], Hiraku Sakamoto[1]

[1]Tokyo Institute of Technology, [2]The University of Tokyo

Session j-1) Mar 3 (Thu) 9:00 - 10:00 [Meeting Room1]

Satellite Communications, Broadcasting and Navigation 1

Chairpersons: Tomoshige Kan (NICT)
Tetsushi Ikegami (Meiji University)

2022-j-02 (9:00 - 9:20)

A Study on Estimation Methodology of Signal Intensity Distribution for Space VLBI

*Masahiro Fujita[1], Yuichiro Nada[1], Yuki Takao[2], Ahmed Kiyoshi Sugihara[2], Junichiro Kawaguchi[3]

[1]The University of Tokyo Department of Aeronautics and Astronautics, [2]Japan Aerospace Exploration Agency, [3]Tohoku University Department of Mechanical and Aerospace Engineering

2022-j-03 (9:20 - 9:40)

A Study of RF Feeder Link System for Data Relay Satellites Supporting Multiple Access

*Mitsuhiro Nakadai, Chihaya Kato, Masanobu Yajima

Japan Aerospace Exploration Agency, Research and Development Directorate, Research Unit

2022-j-04 (9:40 - 10:00)

X-band Signal Observing Experiment from Hayabusa-2 by 2m-class Parabola Antenna

*Yoshihiro Tsuruda, Masaaki Kawamura, Masaki Nakamiya

Teikyo University

Session j-2) Mar 3 (Thu) 11:00 - 12:00 [Meeting Room1]

Satellite Communications, Broadcasting and Navigation 2

Chairpersons: Masaaki Kojima (NHK)
Tetsushi Ikegami (Meiji University)

2022-j-06 (11:00 - 11:20)

Flight Demonstration Results of Information Theoretically Secure Wireless Communication on a Sounding Rocket MOMO

*Sumio Morioka[1], Satoshi Obana[2], Maki Yoshida[3]

[1]Interstellar Technologies Inc., R&D division, [2]Hosei University, Faculty of computer and information sciences, [3]NICT, Cybersecurity research institute

2022-j-07 (11:20 - 11:40)

On-orbit Demonstration of VCM Technology Based on DVB-S2X by the Rapid Innovative Payload Demonstration Satellite-2

*Chihaya Kato[1], Mitsuhiro Nakadai[1], Masanobu Yajima[1], Jin Miyazawa[2], Michiya Hayama[3], Tsuyoshi Sasaki[2], Futaba Ejima[2]

[1]Japan Aerospace Exploration Agency (JAXA), [2]Mitsubishi Electric Corporation Kamakura Works, [3]Mitsubishi Electric Corporation Information Technology R&D Center

2022-j-08 (11:40 - 12:00)

Development of 3 Dimensional Phased Array Antenna for the Satellite Ground Stations

*Nobuyuki Kaya

WaveArrays, inc.

Session j-3) Mar 3 (Thu) 16:00 - 17:20 [Meeting Room1]

Satellite Communications, Broadcasting and Navigation 3

Chairpersons: Yoshihisa Takayama (Tokai University)
Mitsuhiro Nakadai (JAXA)

2022-j-09 (16:00 - 16:20)

Development of Stepless Attenuator to Emulate a Mobile Satellite Communications System

*Byeongpyo Jeong, Tomoshige Kan, Takashi Takahashi

National Institute of Information and Communications Technology

2022-j-10 (16:20 - 16:40)

A Wide Area Propagation Measurement for Mobile Satellite Communications using Ka band satellite

*Tomoshige Kan, Byeongpyo Jeong, Hajime Susukita, Takashi Takahashi

National Institute of Information and Communications Technology. Space Communication Systems Laboratory

2022-j-11 (16:40 - 17:00)

DPD Performance for 12-GHz-band Satellite Transponder with APD Linearized TWTA

*Masaaki Kojima, Masashi Kamei, Hisashi Sujikai

NHK Science & Technology Research Laboratories

2022-j-12 (17:00 - 17:20)

Study on onboard antenna pointing deviation and control error for wireless relay system using fixed wing UAV

*Koki Hamajima[1], Masazumi Ueba[1], Munehiro Matsui[2], Hisayoshi Kanou[2], Kiyohiko Itokawa[2], Fumihiro Yamashita[2]

[1]Muroran Institute of Technology, [2]NTT Access Service System Laboratories, NTT Corporation

Session k-1) Feb 28 (Mon) 15:40 - 16:20 [Meeting Room4]

ISS and Near Future Lunar Mission

Chairperson: TBD

2022-k-01 (15:40 - 16:00)

Engineering facilities and tools aboard the ISS Russian Segment over testing of key exploration technologies

*Igor V. Sorokin, Alexander V. Markov, Victor P. Konoshenko

S.P. Korolev Rocket and Space Corporation Energia

2022-k-04 (16:00 - 16:20)

Obstacles at candidate landing sites with long-term illuminated areas of lunar south pole region

*Junichi Haruyama[1], Kazuki Kariya[1], Yuji Katsumata[1], Masaru Koga[1], Naoki Sato[1], Seiichi Hara[2]

[1]JAXA, [2]NTT DATA CCS

Session k-2) Mar 1 (Tue) 9:20 - 10:40 [Meeting Room4]

Exploration to Lunar Hole and Lava Tube

Chairperson: TBD

2022-k-05 (9:20 - 9:40)

Unprecedented Zipangu Underworld of the Moon/Mars Exploration (UZUME) : Great resource-based exploration benefits

*Junichi Haruyama

JAXA

2022-k-06 (9:40 - 10:00)

Science mission of UZUME-1

*Daigo Shoji[1], Junichi Haruyama[1], Tomokatsu Morota[2], Nobuo Geshi[3], Goro Komatsu[4], Motomaro Shirao[5], Tsutomu Honda[6], Tatsuhiro Michikami[7], Hisayoshi Shimizu[2]

[1]JAXA, [2]The University of Tokyo, [3]AIST, [4]Universita d'Annunzio, [5]Planetary Geological Society of Japan, [6]NPO Volcano-Speleological Society, [7]Kindai University

2022-k-07 (10:00 - 10:20)

Development of a Detection Method of Intact Lava Tubes on the Moon Using the FDTD Simulation

*Hitoshi Nozawa[1], Junichi Haruyama[2,1], Atsushi Kumamoto[3], Takahiro Iwata[2,1]

[1]The Graduate University for Advanced Studies (SOKENDAI), [2]Japan Aerospace Exploration Agency (JAXA), [3]Tohoku University

2022-k-08 (10:20 - 10:40)

Robotic Exoskeletons for Payload Transportation in Lunar Caves

*Stephane Bonardi[1], Lucas Froissart[2], Toshihisa Nikaido[1], Auke Ijspeert[2], Takashi Kubota[1]

[1]Japan Aerospace Exploration Agency (JAXA), [2]Ecole Polytechnique Federale de Lausanne (EPFL)

Session k-3) Mar 1 (Tue) 11:00 - 12:40 [Meeting Room4]

Robotics abs Sampling Technologies

Chairperson: TBD

2022-k-09 (11:00 - 11:20)

Lunar Skylight Exploration by a Limbed Climbing Robot Using a Hand-Eye System

*Taku Okawara, Kentaro Uno, Kazuya Yoshida

Tohoku Univercity

2022-k-10 (11:20 - 11:40)

Walking Control for a Bipedal Robot Used in the Moon Base Considering an Optimal Stride

*Takafumi Kanda, Jyun Satou, Tadashi Komatsu

Kanto Gakuin University

2022-k-11 (11:40 - 12:00)

Path and Gait Planning of Limbed Climbing Robots for Planetary Cliff Exploration

*Keigo Haji, Kentaro Uno, Warley F. R. Ribeiro, Kazuya Yoshida

Tohoku Univ. Department of Aerospace Engineering

2022-k-12 (12:00 - 12:20)

Long-Range Vertical Transport of Lunar Regolith and Ice Particles Using Electrodynamic Force and Mechanical Vibration

*Hiroyuki Kawamoto

Waseda University

2022-k-13 (12:20 - 12:40)

Numerical Simulation of Regolith Sampling Corer by Irreversible Compression Fluid Model

*Kojiro Suzuki

Graduate School of Frontier Sciences, The University of Tokyo

Session k-4) Mar 1 (Tue) 16:00 - 17:00 [Meeting Room4]

Lunar Materials and Utlization

Chairperson: TBD

2022-k-14 (16:00 - 16:20)

The Investigation of Spatial Distribution of Volatiles on the Moon Using the Spectrum Data by SELENE

*Kosei Toyokawa[1,2], Junichi Haruyama[2,1], Takahiro Iwata[2,1]

[1]The Graduate University of Advanced Studies, [2]Institute of Space and Astronautical Science

2022-k-15 (16:20 - 16:40)

Dynamical Properties of Granular Vibration Pumping for ISRU

*Masato Adachi[1,2], Patricia Sophie Schneider[2,3], Matthias Sperl[2,3]

[1]Kyoto University, Graduate School of Engineering, Department of Mechanical Engineering and Science,
[2]Deutsches Zentrum fur Luft- und Raumfahrt (DLR), Institut für Materialphysik im Weltraum,
[3]Universität zu Koln, Institut für Theoretische Physik

2022-k-16 (16:40 - 17:00)

Studies on Astronomical Observatory utilizing the Lunar Holes and Lava Tubes

*Takahiro Iwata[1], Junichi Haruyama[1], Hideo Hanada[2]

[1]Institute of Space and Astronautical Science, JAXA, [2]National Astronomical Observatory of Japan

Session k-5) Mar 2 (Wed) 9:00 - 10:40 [Meeting Room4]

Small Body Explorations - Hayabusa2 and MMX

Chairperson: TBD

2022-k-18 (9:00 - 9:20)

The Deep Space Orbital Transfer Vehicle Inspired by the Hayabusa2 Technology

*Yuto Takei[1], Takanao Saiki[1], Roger Gutierrez Ramon[2], Naoko Ogawa[1], Yuya Mimasu[1], Maiko Yamakawa[2], Yusuke Maru[1], Yuichi Tsuda[1]

[1]Japan Aerospace Exploration Agency, [2]The Graduate University for Advanced Studies

2022-k-19 (9:20 - 9:40)

In-Situ Trajectory Reconstruction and Telescopic Tracking of HAYABUSA2 Sample Return Capsule by Ground and Airborne Observations

*Kazuhisa Fujita, Satoshi Nomura, Toshiyuki Suzuki, Takashi Ozawa, Hiroki Takayanagi, Mari Nishiyama, Shunsuke Noguchi, Tomoko Iijima, Junichi Oki, Hideyuki Tanno, Tetsuya Yamada, Satoru Nakazawa

Japan Aerospace Exploration Agency

2022-k-20 (9:40 - 10:00)

Crack Orientation of Boulders on Ryugu: Meridional Preference and Exfoliation

*Sho Sasaki[1], Shiho Kanda[1], Hiroshi Kikuchi[2], Tatsuhiro Michikami[3], Tomokatsu Morota[4], Chikatoshi Honda[5], Hideaki Miyamoto[4], Ryodo Henmi[4], Seiji Suguta[4], Eri Tatsumi[4], Masanori Kanamaru[2], Seiichiro Watanabe[6], Noriyuki Namiki[7], Patrik Michel[8], Masatoshi Hirabayashi[9], Naru Hirata[5], Tomoki Nakamura[10], Takaaki Noguchi[11], Takahiro Hiroi[12], Naoya Sakatani[13]

[1]Osaka University, Department of Earth and Space Science, [2]JAXA, ISAS, [3]Kindai University, [4]University of Tokyo, [5]University of Aizu, [6]Nagoya University , [7]National Astronomical Observatory of Japan, [8]Observatoire de la Cote d'Azur, [9]Auburn University, [10]Tohoku University, [11]Kyoto University, [12]Brown University, [13]Rikkyo University

2022-k-21 (10:00 - 10:20)

Martian Moons eXploration (MMX) Mission Description

*Yasuhiro Kawakatsu, Kiyoshi Kuramoto, Hisashi Otake, Takane Imada, Hajime Baba

JAXA MMX Project Team

2022-k-22 (10:20 - 10:40)

Technological Development of Dust Sensor for CMDM to be aboard MMX

*Masanori Kobayashi[1], Osamu Okudara[1], Ryo Ishimaru[1], Sho Sasaki[2], Masayuki Fujii[3]

[1]Planetary Exploration Research Center, Chiba Institute of Technology,
[2]Department of Earth and Space Science, Osaka University, [3]FAM science Co., Ltd.

Session k-6) Mar 2 (Wed) 11:00 - 12:00 [Meeting Room4]

Martian and Plasma Science and Missions

Chairperson: TBD

2022-k-25 (11:00 - 11:20)

A New Way to Explore Mars with a Micro-size Airplane in the Sky -Mars Shot PLUS-

*Hiroki Nagai

Institute of Fluid Science, Tohoku University

2022-k-26 (11:20 - 11:40)

Super-Alfvénic Collision of Extremely High-beta Plasmoids for Collisionless Shock Experiments

*Taichi Seki[1], Tomohiko Asai[1], Daichi Kobayashi[1], Tsutomu Takahashi[1], Takamasa Kikuchi[1], Hiroshi Hasebe[1], Koichi Iwamoto[1], Shinichiro Ohnuki[1], Seiya Kishimoto[1], Jordan Morelli[2]

[1]Nihon Univ. College of Science and Technology, [2]Queen's University at Kingston

2022-k-27 (11:40 - 12:00)

A Laboratory Astrophysical Project Toward Understanding Mysterious Fast Radio Bursts

*Yoske Sumitomo[1], Tomohiko Asai[1], Shota Kisaka[2], Haruhisa Koguchi[3], Kazuhiro Kusaka[1], Ryotaro Yanagi[1], Yuma Onishi[1], Yasushi Hayakawa[1], Daichi Kobayashi[1], Shiomi Kumagai[1], Takeshi Sakai[1], Taichi Seki[1]

[1]Nihon University, College of Science and Technology, [2]Hiroshima University,
[3]National Institute of Advanced Industrial Science and Technology (AIST)

Session l-1) Feb 28 (Mon) 15:40 - 17:10 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 1

Chairperson: TBD

Session l-2) Mar 1 (Tue) 9:00 - 10:00 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 2

Chairpersons: Hajime Yano (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency)
Baker John (JPL)

2022-l-04 (9:00 - 9:30)

Ready for launch: CubeSat Moon Lander OMOTENASHI

*Tatsuaki Hashimoto, Junji Kikuchi, Ryo Hirasawa, Shintaro Nakajima, Naoki Morishita, Atsushi Tomiki, Wataru Torii, Masatsugu Otsuki, Tetsuo Yoshimitsu, Yasuo Ishige, Kota Miyoshi, Nobutaka Bando, Chikako Hirose, Hiroshi Takeuchi, Hiroyuki Toyota, Keiichi Hori, Kakeru Tokunaga, Aiko Nagamatsu, Hitoshi Morimoto, Toshinori Ikenaga

JAXA

2022-l-05 (9:30 - 10:00)

Janus: A NASA SIMPLEx mission to explore two NEO Binary Asteroids

*Daniel J Scheeres[1], Jay McMahon[1], E. B. Bierhaus[2], J. Wood[2], L. A.M. Benner[3], C. M. Hartzell[4], P. Hayne[1], R. Jedicke[5], L. Le Corre[6], A. Meyer[1], S. Naidu[3], P. Pravec[7], M. Ravine[8], K. Sorli[1]

[1]University of Colorado Boulder, [2]Lockheed Martin Space, USA,, [3]Jet Propulsion Laboratory, USA, [4]University of Maryland, USA, [5]University of Hawaii, USA, [6]Planetary Science Institute, USA, [7]Astronomical Institute of the Academy of Sciences, Czech Republic, [8]Malin Space Science Systems Inc, USA

Session l-3) Mar 1 (Tue) 11:00 - 11:30 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 3

Chairperson: TBD

2022-l-07 (11:00 - 11:30)

Deep Space Exploration Technology Demonstrator DESTINY+

*Hiroyuki Toyota[1], Takeshi Takashima[1], Hiroshi Imamura[1], Kazutaka Nishiyama[1], Takayuki Yamamoto[1], Takeshi Miyabara[1], Masayuki Ohta[1], Yoshitaka Mochihara[1], Naoya Ozaki[1], Hiroyuki Nagamatsu[1], Takakazu Okahashi[1], Junko Takahashi[1], Toshiaki Okudaira[1], Tomoko Arai[2], DESTINY+ Project Team[1]

[1]JAXA/ISAS, [2]Chiba Institute of Technology/PERC

Session l-4) Mar 1 (Tue) 16:00 - 16:20 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 4

Chairpersons: Ryu Funase (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency)
Bousquet Pierre (CNES)

2022-l-10 (16:00 - 16:20)

CubeSat Complemented Radioscience for the Geodesy of Non-heliocentric Small Bodies

*Hongru Chen[1], Nicolas Rambaux[2], Valery Lainey[2], Daniel Hestroffer[2]

[1]Department of Aeronautics and Astronautics, Kyushu University,
[2]IMCCE, Observatoire de Paris, Université PSL, Sorbonne Université, Université de Lille, CNRS

Session l-5) Mar 2 (Wed) 9:00 - 9:20 [Meeting Room32]

IAA Low- Cost Planetary Missions Conference 5

Chairpersons: Baker John (JPL)
Ryu Funase (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency)

Session I-6) Mar 2 (Wed) 11:00 - 11:20 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 6

Chairperson: TBD

2022-I-17 (11:00 - 11:20)

Deployable Micro-Mars Airplane Stowed in 1U Cubesat

*Hiroto Tanaka[1], Tsubasa Ikami[1], Kohe Sone[1], Yudai Hamashima[1], Kohe Takeda[1], Kento Kaneko[2], Kazuma Yomo[1], Tatsuya Kobayashi[1], Maki Okawa[1], Koji Fujita[1], Hiroki Nagai[1]

[1]Tohoku University, [2]The University of Tokyo

Session I-7) Mar 2 (Wed) 16:00 - 16:15 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 7

Chairpersons: Bousquet Pierre (CNES)
Hajime Yano (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency)

2022-I-21 (16:00 - 16:15)

Asynchronous One-Way Ranging Method Applied to Lunar and Interplanetary Probes

*Junichiro Kawaguchi[1], Yuichiro Nada[2], Yuka Ishigooka[1], Toshinori Kuwahara[1], Kazuya Yoshida[1]

[1]Tohoku University, [2]University of Tokyo

Session I-8) Mar 3 (Thu) 9:00 - 10:30 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference 8

Chairpersons: Hajime Yano (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency)
Baker John (JPL)

Session I-9) Mar 3 (Thu) 11:00 - 12:30 [Meeting Room32]

IAA Low-Cost Planetary Missions Conference

Chairperson: Ryu Funase (Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency)

Session m-1) Mar 1 (Tue) 16:00 - 17:40 [Meeting Room1]

Operation and Engineering of Balloon

Chairpersons: Yoshitaka Saito (Japan Aerospace Exploration Agency)
Kosei Ishimura (Waseda University)

2022-m-01 (16:00 - 16:20)

Balloon operations at Esrange Space Center since the last ISTS

*Mattias Abrahamsson, Henrik Pettersson

SSC - Swedish Space Corporation

2022-m-02 (16:20 - 16:40)

Flight Prediction and Control System for JAXA Scientific Balloon Operation

*Yoshitaka Mizumura, Hideyuki Fuke, Tetsuya Yoshida

Japan Aerospace Exploration Agency

2022-m-03 (16:40 - 17:00)

Development of an Automated Test System for On-board Balloon-Borne Bus Equipment

*Hideyuki Mori[1], Hideyuki Fuke[1], Makoto Tamura[1], Tetsuya Yoshida[2]

[1]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, Scientific Ballooning Research and Operation Group, [2]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science, Department of Interdisciplinary Space Science

2022-m-04 (17:00 - 17:20)

Study on Attitude Motion of Balloon Flight Trains based on Distributed Attitude Measurements

*Yasuhiro Shoji[1], Issei Iijima[2]

[1]Kanazawa University, [2]JAXA

2022-m-05 (17:20 - 17:40)

Flight Tests of Perovskite Solar Cell toward Applications to Balloon Envelope

*Hideyuki Fuke[1], Shusaku Kanaya[1], Yu Miyazawa[1], Hiroyuki Toyota[1], Kazuyuki Hirose[1], Ryoto Funayama[2], Masashi Ikegami[3]

[1]JAXA, [2]Kishu Giken Kogyo Co., Ltd., [3]Toin University of Yokohama

Session m-2) Mar 2 (Wed) 9:00 - 10:00 [Meeting Room1]

Science Mission using Balloon and Rocket

Chairpersons: Yoshitaka Mizumura (Japan Aerospace Exploration Agency)
Keigo Ishizaka (Toyama Prefectural University)

2022-m-07 (9:00 - 9:20)

LODEWAVE (LOng-Duration balloon Experiment of gravity WAVE over Antarctica)

*Yoshihiro Tomikawa[1,2], Kaoru Sato[3], Yoshitaka Saito[4], Isao Murata[5], Naohiko Hirasawa[1,2], Masashi Kohma[3], Kyoichi Nakashino[6], Daisuke Akita[7], Takuma Matsuo[8], Masatomo Fujiwara[9], Lihito Yoshida[2]

[1]National Institute of Polar Research, [2]School of Multidisciplinary Sciences, The Graduate University for Advanced Studies, SOKENDAI, [3]Graduate School of Science, The University of Tokyo, [4]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, [5]Graduate school of Environmental Studies, Tohoku University, [6]School of Engineering, Tokai University, [7]School of Environment and Society, Tokyo Institute of Technology, [8]School of Science and Technology, Meiji University, [9]Faculty of Environmental Earth Science, Hokkaido University

2022-m-08 (9:20 - 9:40)

New Particle Identification Approach with Convolutional Neural Network in GAPS

Yusuke Nakagami[1], *Masahiro Yamatani[2], Hideyuki Fuke[2], Akiko Kawachi[3], Masayoshi Kozai[4], Yuki Shimizu[5], Tetsuya Yoshida[2]

[1]Aoyama Gakuin University, [2]JAXA, [3]Tokai Univeristy, [4]ROIS, [5]Kanagawa Univeristy

2022-m-09 (9:40 - 10:00)

Development of Atmospheric Density Probe aboard S-520-32 Sounding Rocket

*Shoma Taira[1], Taishi Kato[1], Momoka Shimoi[1], Taiga Adachi[1], Towa Ushijima[1], Yusuke Yamashita[2], Takashi Ozawa[3], Takumi Abe[3,4], Yoshinori Nakayama[5], Kumiko Yokota[1], Masahito Tagawa[1]

[1]Kobe University, [2]The University of Tokyo, [3]Japan Aerospace Exploration Agency, [4]Institute of Space and Astronautical Science, [5]National Defense Academy

Session m-3) Mar 2 (Wed) 11:00 - 12:20 [Meeting Room1]

Flight Demonstraion of Detonation Engine

Chairpersons: Jiro Kasahara (Nagoya University)
Yusuke maru (Japan Aerospace Exploration Agency)

2022-m-10 (11:00 - 11:20)

In-Space Flight Demonstration Results of a Detonation Engine System on Sounding Rocket S-520-31: System Design

*Akira Kawasaki[1], Koichi Matsuyama[1], Ken Matsuoka[1], Hiroaki Watanabe[1], Noboru Itouyama[1], Keisuke Goto[1], Kazuki Ishihara[1], Valentin Buyakofu[1], Tomoyuki Noda[1], Jiro Kasahara[1], Akiko Matsuo[2], Ikkoh Funaki[4], Daisuke Nakata[3], Masaharu Uchiumi[3], Hiroto Habu[4], Shinsuke Takeuchi[4], Satoshi Arakawa[4], Junichi Masuda[4], Kenzi Maehara[4], Tatsuro Nakao[5], Kazuhiko Yamada[4]

[1]Nagoya University, [2]Keio University, [3]Muroran Institute of Technology, [4]ISAS/JAXA, [5]JAXA

2022-m-11 (11:20 - 11:40)

In-Space Flight Demonstration Results of a Detonation Engine System on Sounding Rocket S-520-31: Flight Path and Attitude

*Hiroaki Watanabe[1], Koichi Matsuyama[1], Ken Matsuoka[1], Akira Kawasaki[1], Noboru Itouyama[1], Keisuke Goto[1], Kazuki Ishihara[1], Valentin Buyakofu[1], Tomoyuki Noda[1], Shiro Ito[1], Jiro Kasahara[1], Akiko Matsuo[2], Ikkoh Funaki[3], Daisuke Nakata[4], Masaharu Uchiumi[4], Hiroto Habu[3], Shinsuke Takeuchi[3], Satoshi Arakawa[3], Junichi Masuda[3], Kenzi Maehara[3], Tatsuro Nakao[5], Kazuhiko Yamada[3]

[1]Nagoya University, Department of Aerospace Engineering, [2]Keio University, Department of Mechanical Engineering,
[3]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science,
[4]Muroran Institute of Technology, Aerospace Plane Research Center, [5]Japan Aerospace Exploration Agency

2022-m-12 (11:40 - 12:00)

In-Space Flight Demonstration Results of a Detonation Engine System on Sounding Rocket S-520-31: Rotating Detonation Engine

*Keisuke Goto[1], Koichi Matsuyama[1], Ken Matsuoka[2], Akira Kawasaki[2], Hiroaki Watanabe[2], Noboru Itouyama[1], Kazuki Ishihara[2], Valentin Buyakofu[2], Tomoyuki Noda[2], Jiro Kasahara[2], Akiko Matsuo[3], Ikkoh Funaki[4], Daisuke Nakata[5], Masaharu Uchiumi[5], Hiroto Habu[4], Shinsuke Takeuchi[4], Satoshi Arakawa[4], Junichi Masuda[4], Kenji Maehara[4], Tatsuro Nakao[6], Kazuhiko Yamada[4]

[1]Nagoya Univ. Institute of Materials and Systems for Sustainability, [2]Nagoya Univ. Department of Aerospace Engineering,
[3]Keio Univ. Department of Mechanical Engineering, [4]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science,
[5]Muroran Institute of Technology, Aerospace Plane Research Center,
[6]Japan Aerospace Exploration Agency, Unit I, Research and Development Directorate

2022-m-13 (12:00 - 12:20)

In-Space Flight Demonstration Results of a Detonation Engine System on Sounding Rocket S-520-31: Pulse Detonation Engine

*Valentin Buyakofu[1], Ken Matsuoka[1], Koichi Matsuyama[1], Keisuke Goto[1], Akira Kawasaki[1], Hiroaki Watanabe[1], Noboru Itouyama[1], Kazuki Ishihara[1], Tomoyuki Noda[1], Jiro Kasahara[1], Akiko Matsuo[2], Ikkoh Funaki[3], Daisuke Nakata[4], Masaharu Uchiumi[4], Hiroto Habu[3], Shinsuke Takeuchi[3], Satoshi Arakawa[3], Junichi Masuda[3], Kenji Maehara[3], Yamada Kazuhiko[3], Tatsuro Nakao[5]

[1]Nagoya University, [2]Keio Univesity, [3]JAXA/ISAS, [4]Muroran Institute of Technology, [5]JAXA

Session m-4) Mar 2 (Wed) 16:00 - 17:00 [Meeting Room1]

Research and Development of Advanced Flight Vehicle

Chairpersons: Daisuke Akita (Tokyo Institute of Technology)
Akira Kawasaki (Nagoya University)

2022-m-14 (16:00 - 16:20)

Development and Flight Demonstration of Reentry and Recovery Module with Deployable Aeroshell Technology for Sounding Rocket Experiment

*Kazuhiko Yamada[1], Tatsuro Nakao[1], Hitoshi Hamori[1], Yasunori Nagata[1], Takahiro Ishimaru[1], Shun Imai[1], Kaho Maeda[1], Kenji Maehara[1], Takahiro Moriyoshi[1], Hideo Takayasu[1], Yuuki Akimoto[2], Hideto Takasawa[3], Minami Mori[4], Marie Mitsuno[4], Koshiro Hirata[5], Tatsuma Kawakubo[6], Yuuma Yagi[1], Ryosuke Ono[1], Hiroto Habu[1], Kojiro Suzuki[7]

[1]Japan Aerospace Exploration Agency, [2]Nagoya University, [3]Hokkido University, [4]Tokyo University of Science, [5]The University of Agriculture and Technology, [6]Tokyo Institute of Technology, [7]The University of Tokyo

2022-m-15 (16:20 - 16:40)

Flight Test and Simulation of Active Aeroelastic Control Technology Demonstrator for Realization of Small Pseudo-Satellite

*Naoto Morita, Shinichi Nakasuka, Takeshi Tsuchiya

The University of Tokyo, Department of Aeronautics and Astronautics

2022-m-16 (16:40 - 17:00)

Optimum Configuration of Super-Pressure Balloon Covered by a Diamond-Shaped Net

*Kyoichi Nakashino[1], Yoshitaka Saito[2], Daisuke Akita[3], Takuma Matsuo[4]

[1]Tokai University, Department of Aeronautics and Astronautics, [2]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, [3]Tokyo Institute of Technology, Department of Transdisciplinary Science and Engineering, [4]Meiji University, Department of Mechanical Engineering

Session n-1) Mar 2 (Wed) 9:00 - 10:40 [Meeting Room33]

Earth Environmental Observation by Optical Imager

Chairperson: Rigen Shimada (Japan Aerospace Exploration Agency)

2022-n-01 (9:00 - 9:20)

Global Environment Observation by GCOM-C "SHIKISAI"

*Hiroshi Murakami

Japan Aerospace Exploration Agency, Earth Observation Research Center

2022-n-02 (9:20 - 9:40)

APAR Variability in the Northeast Asia Seas

*Robert J Frouin[1], Jing Tan[1], Toru Hirawake[2], Hiroshi Murakami[3]

[1]Scripps Institution of Oceanography, [2]National Institute of Polar Research, [3]JAXA

2022-n-03 (9:40 - 10:00)

Monitoring of Simultaneous Floods Around a Retarding Basin Using Satellite Images

*Toshiro Sugimura[1], Kuniaki Isobe[2], Yuuki Uchida[1]

[1]Nihon Univ. Department of Civil Engineering, [2]Chuo College of Technology

2022-n-04 (10:00 - 10:20)

Quantification of Submerged Aquatic Vegetation in Lake Biwa Using GCOM-C

*Hiroaki Sato[1], Junichi Susaki[2], Kanako Ishikawa[3], Daikichi Seki[4], Yosuke Alex. Yamashiki[1,4]

[1]Graduate School of Advanced Integrated Studies in Human Survivability Kyoto University, [2]Kyoto University, [3]Lake Biwa Environmental Research Institute, [4]SIC Human Spaceology Center, GSAIS, Kyoto University

2022-n-05 (10:20 - 10:40)

Image Matching Strategy with Other Satellite Imageries for Geostationary Earth Observation Satellite

*Yosuke Takeo[1], Takeshi Sekiguchi[1], Shinji Mitani[1], Makoto Maruya[2]

[1]Japan Aerospace Exploration Agency , [2]Geoinsight LLC.

Session n-2) Mar 2 (Wed) 11:00 - 12:40 [Meeting Room33]

Satellite Precipitation Measurement and Application

Chairperson: Keiji Imaoka (Yamaguchi University)

2022-n-06 (11:00 - 11:20)

Accuracy Assessment of the Global Satellite Mapping of Precipitation (GSMaP) by Future Small Precipitation Radar Constellation

*Moeka Yamaji, Takuji Kubota

JAXA

2022-n-07 (11:20 - 11:40)

An approach to Rainfall Normalization Module for GSMaP Microwave Imagers and Sounders

*Munehisa K. Yamamoto[1], Takuji Kubota[2]

[1]Remote Sensing Technology Center of Japan, [2]Japan Aerospace Exploration Agency

2022-n-08 (11:40 - 12:00)

Validation of the Flood Simulation Utilizing Satellite Observation in Japan

*Kosuke Yamamoto[1,2], Masato Ohki[1], Kei Yoshimura[2,1]

[1]JAXA, [2]The University of Tokyo

2022-n-09 (12:00 - 12:20)

A Bias Correction Algorithm for the GSMaP in GEO IR observing areas

*Hitoshi Hirose[1], Tomoko Tashima[1], Takuji Kubota[1], Tomoaki Mega[2], Tomoo Ushio[2]

[1]Japan Aerospace Exploration Agency, [2]Osaka Univ. Department of Engineering

2022-n-10 (12:20 - 12:40)

Precipitable Water Estimates from AHI Infrared Bands

*Keiji Imaoka[1], Misako Kachi[2]

[1]Center for Information Infrastructure, Yamaguchi University, [2]Earth Observation Research Center, Japan Aerospace Exploration Agency

Session n-3) Mar 2 (Wed) 16:00 - 17:00 [Meeting Room33]

Small Satellites and New Approaches

Chairperson: Hiroshi Murakami (Japan Aerospace Exploration Agency)

2022-n-13 (16:00 - 16:20)

Urban Growth Impact Assessment for Outdoor Thermal Comfort and Urban-Heat Island in Manila City, Philippines

*Mark Angelo Purio[1,3], Tetsunobu Yoshitake[2], Mengu Cho[3]

[1]Electronics Engineering Department, Adamson University, Philippines,
[2]Department of Civil and Architectural Engineering, Kyushu Institute of Technology, Kitakyushu City, Japan,
[3]The Laboratory of Lean Satellite Enterprises and In-Orbit Experiments (LaSEINE), Kyushu Institute of Technology, Japan

2022-n-14 (16:20 - 16:40)

Observations of Middle Atmosphere Using Artificial Meteors, Especially Effect of Atmospheric Density Distribution

*Chiho Motegi[1], Tsubasa Higashi[1], Ryo Oguro[1], Marin Uchikado[1], Kei Ishikawa[1], Hironori Sahara[1], Yusuke EGAWA[2], Koh KAMACHI[2]

[1]Tokyo Metropolitan University, Japan, [2]ALE Co., Ltd.

2022-n-15 (16:40 - 17:00)

Infrasound Investigation on Rocket Launches from Tanegashima Space Center, Japan

*Islam Hamama[1,2], Masa-yuki Yamamoto[1]

[1]School of Systems Engineering, Kochi University of Technology, Japan, [2]National Research Institute of Astronomy and Geophysics, NRIAG, Egypt

Session n-4) Mar 3 (Thu) 9:00 - 10:20 [Meeting Room33]

Land Optical Observation and Application

Chairperson: Rei Mitsuhashi (Japan Aerospace Exploration Agency)

2022-n-17 (9:00 - 9:20)

Generalized Segmentation Model for Imbalanced High-Resolution Satellite Images Using Entropy Weighted Loss

*Kenichi Sasaki[1], Tatsuyuki Sekine[2], Makoto Yoshioka[2]

[1]University of Colorado Boulder, Department of Aerospace Engineering and Sciences, [2]Amanogi corp.

2022-n-18 (9:20 - 9:40)

Volcano Monitoring on Suwanosejima Island by Satellite Images

*Yuuki Uchida[1], Kuniaki Isobe[2], Toshiro Sugimura[1]

[1]Nihon Univ. Department of Civil Engineering, [2]Chuo College of Technology

2022-n-19 (9:40 - 10:00)

Calibration Facilities and Method Based on Point-Source Reflectors for Optical Satellite Data Application

*Masahiko Nagai, Nopphawan Tamkuan, Dorj Ichikawa, Yumiko Nagai, Tsuyoshi Eguchi, Vaibhav Katiyar

Yamaguchi University, Japan

2022-n-20 (10:00 - 10:20)

New spaceborne LIDAR waveform analyse method applied to GEDI waveforms

*Rei Mitsuhashi, Yoshito Sawada, Masato Hayashi, Tadashi Imai

Japan Aerospace Exploration Agency

Session n-5) Mar 3 (Thu) 11:00 - 12:40 [Meeting Room33]

Synthetic Aperture Radar and Application

Chairperson: Haemi Park (Japan Aerospace Exploration Agency)

2022-n-21 (11:00 - 11:25)

ALOS-2 PALSAR-2 based Soil Moisture Estimation in Chitose, Hokkaido, Japan

*Haemi Park, Takeo Tadono

JAXA Earth Observation Research Center

2022-n-22 (11:25 - 11:50)

ALOS-2 - the Pioneer Mission for L-band SAR Long-term Pantropical Forest Monitoring

*Christian Koyama[1], Manabu Watanabe[2], Izumi Nagatani[1], Masato Hayashi[1], Masanobu Shimada[2], Takeo Tadono[1]

[1]JAXA, [2]Tokyo Denki University

2022-n-23 (11:50 - 12:15)

Geometric Condition of Reinforced Slopes for InSAR Analysis using ALOS-2/PALSAR-2 Data

*Tomohito Asaka, Takashi Nonaka

Nihon University

2022-n-24 (12:15 - 12:40)

ALOS-4 Signal Simulation

*Katia Nagamine Urata, Takeo Tadono, Takeshi Motohka

Japan Aerospace Exploration Agency

Session p-1) Feb 28 (Mon) 15:40 - 17:20 [Meeting Room1]

Space Life Science

Chairperson: Takeshi Nikawa (Institute of Medical Biosciences/Institute of Space Nutrition Tokushima Univ. Graduate School)

2022-p-01 (15:40 - 16:05)

Mars Glass Town

*Takuya Ono, Makiko Nagura, Juniya Okamura

Kajima Corporation Kansai Branch

2022-p-02 (16:05 - 16:30)

Effects of Electrically Stimulated Eccentric Contraction of Antagonist Muscle on Strength and Muscle Mass of the Agonist Muscle

*Hiroshi Tajima[1,2], Ryuki Hashida[1], Masayuki Omoto[1,2], Takeshi Nago[1], Hiroo Matsuse[1], Naoto Shiba[1]

[1]Kurume Univ. Department of Rehabilitation, [2]Saiseikai Iizuka Kaho Hospital Department of Rehabilitation

2022-p-03 (16:30 - 16:55)

Development of Experimental Approach for Hypervelocity Impact Sterilization

*Takashi Ozawa[1], Satoshi Nomura[1], Kotone Miyajima[2], Kumi Nitta[1], Naomi Takizawa[1], Akira Nakamura[2], Akihiko Yamagishi[3], Haruna Sugahara[1], Kazuhisa Fujita[1]

[1]Japan Aerospace Exploration Agency, [2]University of Tsukuba, [3]Tokyo University of Pharmacy and Life Sciences

2022-p-04 (16:55 - 17:20)

Space Exposure Experiments in Post-Tanpopo Experiments in Progress and in Future.

*Hajime Mita[1], Hajime Yano[2], Itsuki Sakon[3], Yoko Kebukawa[4], Kensei Kobayashi[4], Kaori Yokotani Tomita[5], Kazumichi Nakagawa[6], Masanobu Sugimoto[7], Tetyana MILOJEVIC[8], Akihiko Yamagishi[9], Yoshitaka Bessho[10,11], Hiroshi Katoh[12], Tomoko Abe[13], Izumi Endo[3], Shunta Kimura[2], Midori Ong[5], Tomomichi Fujita[14], Shin-ichi Yokobori[9], Satoshi Kodaira[15], Yukio Uchibori[15]

[1]Fukuoka Institute of Technology, [2]JAXA/ISAS, [3]University of Tokyo, [4]Yokohama National University, [5]University of Tsukuba, [6]Osaka University, [7]Okayama University, [8]University of Wien, [9]Tokyo University of Pharmacy and Life Sciences, [10]RIKEN/Spring-81. Academia Sinica, [11]Mie University, [12]Tokyo Denki University, [13]Hokkaido University, [14]QST

Session q-1) Mar 3 (Thu) 9:00 - 10:20 [Conference Room]

Space Power Systems 1

Chairperson: TBD

2022-q-02 (9:00 - 9:20)

Discharge Phenomena Occurred on High-Power Radiation Antennas and Circuit

*Soki Akutsu[1], Koichi Ijichi[2], Hirobumi Saito[3], Masato Tanaka[5], Tomohiko Saitoh[1], Koji Tanaka[4]

[1]Tokyo University of Science. Faculty of science, Department of applied physics, [2]Japan Space Systems,
[3]Waseda University. Waseda Research Institute for Science and Engineering,
[4]Japan Aerospace Exploration Agency. Institute of Space and Astronautical Science, [5]Synspective Inc.

2022-q-03 (9:20 - 9:40)

Energy Harvesting Using Magnetostrictive Material Based on Active Control

*An Li[1], Taishi Watanabe[1], Yushin Hara[1], Yu Jia[2], Yu Shi[3], Constantinos Soutis[4], Keisuke Otsuka[1], Kanjuro Makihara[1]

[1]Tohoku university. Department of Aerospace Engineering, [2]Aston University. Department of Mechanical Engineering and Design,
[3]University of Chester. Department of Faculty of Science and Engineering, [4]The University of Manchester. Department of Aerospace Engineering

2022-q-04 (9:40 - 10:00)

Evaluation of Space Environment Resistance of WPT System for Solar Power Satellite

*Yusuke Kishida[1], Tatsuya Yamagami[2], Shuji Higashigawa[3], Miki Kaneko[3], Takahisa Tomoda[4], Kazuyoshi Arai[3], Koji Tanaka[4,2]

[1]HOSEI Univ. Graduate School of Science and Engineering, [2]SOKENDAI Department of Space and Astronautical Science,
[3]HOSEI Univ. Faculty of Science and Engineering Course of Mechanical Engineering, [4]Japan Aerospace Exploration Agency

2022-q-05 (10:00 - 10:20)

Aluminum Collection from Laser Ablated Alumina Using Heated Recovery Plate Towards Lunar Regolith Utilization

*Seiya Tanaka[1], Naoki Tanaka[1], Kimiya Komurasaki[1], Hiroyuki Koizumi[2], Rei Kawashima[2]

[1]The University of Tokyo, Department of Aeronautics and Astronautics, [2]The University of Tokyo, Department of Advanced Energy

Session q-2) Mar 3 (Thu) 11:00 - 12:00 [Conference Room]

Space Power Systems 2

Chairperson: TBD

2022-q-06 (11:00 - 11:20)

The Outline of the Current Development Activities of the Space Solar Power System (SSPS) Project towards the Prospective Space Experiment

*Ijichi Koichi[1], Kenji Sasaki[1], Hirotaka Machida[1], Osamu Kashimura[1], Koji Tanaka[2], Kosei Ishimura[3], Ryo Ishikawa[4], Kazuhiko Honjo[4]

[1]Japan Space Systems, [2]Institute of Space and Astronautical Science (ISAS), Japan Aerospace Exploration Agency, [3]Waseda University, [4]The University of Electro-Communications

2022-q-09 (11:20 - 11:40)

Examination of Candidate Reception Sites for Ground Evaluation of SPS Demonstration Test Satellite

*Yoshiyuki Fujino[1], Takuya Inoue[1], Li Jialin[1], Koji Tanaka[2]

[1]Toyo University, [2]ISAS/JAXA

2022-q-10 (11:40 - 12:00)

An electric power and hydrogen management on the lunar surface

*Atsushi Uchida, Hiroki Ichihashi, Anna Kobayashi, Maria Amemiya

Mitsubishi Research Institute, Inc.

Session q-3) Mar 3 (Thu) 16:00 - 17:40 [Conference Room]

Space Power Systems 3

Chairperson: TBD

2022-q-11 (16:00 - 16:20)

Time variation of electrical performance of perovskite solar cells

Teppei Okumura[1], *Momoko Kohsaka[2], Taishi Sumita[1], Mitsuru Imaizumi[1]

[1]JAXA, [2]Advanced engineering services

2022-q-12 (16:20 - 16:40)

Development of Thin Perovskite Solar Cells for Balloon Experiments

*Shusaku Kanaya[1], Hideyuki Fuke[1], Yu Miyazawa[1], Hiroyuki Toyota[1], Kazuyuki Hirose[1], Ryoto Funayama[2], Masashi Ikegami[3]

[1]JAXA, [2]Kishu Giken Kogyo Co., [3]Toin Univ. of Yokohama

2022-q-13 (16:40 - 17:00)

Integrated Fuel Cell Development for Spacecraft Applications

*Hitoshi Nagasaki[1], Takehiro Mugishima[1], Kotaro Horiai[1], Hitoshi Naito[2], Makoto Kawase[2], Yoshitugu Sone[3,4], Satoshi Yonezawa[1]

[1]Honda R&D Co., Ltd., Tochigi, Japan, [2]Research and Development Directorate, JAXA, Tsukuba, Japan, [3]Institute of Space and Astronautical Science, JAXA, Kanagawa, Japan, [4]The Department of Space and Astronautical Science, SOKENDAI, Kanagawa, Japan

2022-q-14 (17:00 - 17:20)

Degradation and State Estimation of Lithium-Ion Batteries in Aerospace

*Linda Juliane Bolay[1,2], Birger Horstmann[1,2], Tobias Schmitt[1,2], Simon Hein[1,2], Omar S. Mendoza-Hernandez[4], Eiji Hososno[6], Yoshitsugu Sone[4,5], Arnulf Latz[1,2,3]

[1]Institute of Engineering Thermodynamics, German Aerospace Center (DLR),
[2]Helmholtz Institute Ulm for Electrochemical Energy Storage (HIU), [3]Institute of Electrochemistry, Ulm University,
[4]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency (JAXA),
[5]The Graduate University of Advanced Studies (SOKENDAI),
[6]Global Zero Emission Research Center, National Institute of Advanced Industrial Science and Technology (AIST)

2022-q-15 (17:20 - 17:40)

Demonstration of Efficient Aerospace Power Controller Prototyping on the DLR Core Avionic Testbed

*Janis Sebastian Haeseker, Niklas Aksteiner, Michael Jetzschmann, Christian Strowik, Norbert Toth

Institute of Space Systems, German Aerospace Center (DLR), Bremen, Germany

Session r-1) Mar 1 (Tue) 16:00 - 16:55 [Conference Room]

Space Environment

Chairpersons: Hiroaki Miyake (Tokyo City University)
Kiyokazu Koga (Japan Aerospace Exploration Agency)

2022-r-01 (16:00 - 16:20)

Analysis of Wake Region Phenomena Behind a Solar Probe in the Solar Corona Through Particle-In-Cell Simulation

*Jorge Alberto Garcia Perez, Kojiro Suzuki

Suzuki Laboratory, Department of Aeronautics and Astronautics, Graduate School of Engineering, The University of Tokyo

2022-r-02 (16:20 - 16:40)

Ground-based Experiment for Simultaneous N2 Collisions Effect on Atomic Oxygen-induced Polyimide Erosion in sub-low Earth Orbit

*Sasuga Horimoto[1], Atsushi Fujita[1], Shohei Urakawa[2], Santa Nishioka[2], Wataru Ide[1], Kumiko Yokota[1], Masahito Tagawa[1]

[1]Kobe Univ. Graduate School of Engineering, [2]Kobe Univ. Depertment of Mechanicl Engineering

2022-r-03 (16:40 - 16:55)

Performance Evaluation of Electron Emitting Film for Preventing Spacecraft Charging under Vacuum Ultraviolet Environment

*Daiki Hamada

Kyushu Institute of Technology

Session r-2) Mar 2 (Wed) 9:00 - 10:20 [Conference Room]

NEO, Space Debris Observation

Chairpersons: Hideaki Hinagawa (Japan Aerospace Exploration Agency)
Toshifumi Yanagisawa (Japan Aerospace Exploration Agency)

2022-r-04 (9:00 - 9:20)

On Orbital Dynamics of Gravity Tractor Spacecraft Exploiting Artificial Halo Orbit

*Kohei Yamaguchi, Xinbo Gu, Takaya Inamori, Ji Hyun Park

Nagoya University, Department of Aerospace Engineering

2022-r-05 (9:20 - 9:40)

POLARIS: Software to Extract Angle Measurement from Optical Image

*Takuya Hatakeyama, Yuki Akiyama, Hideaki Hinagawa, Shinichi Nakamura

Japan Aerospace Exploration Agency

2022-r-06 (9:40 - 10:00)

A Target Object Classification of Radar Observation Data with Constrained Admissible Region Analysis

*Koki Fujita[1], Yuya Ariyoshi[1], Yasuhiro Yoshimura[2], Yasunobu Ogawa[3], Toshiya Hanada[2]

[1]Department of Aerospace Engineering, Nippon Bunri University, [2]Department of Aeronautics and Astronautics, Kyushu University, [3]National Institute of Polar Research

2022-r-07 (10:00 - 10:20)

Experiment of HTV-X Attitude Motion Estimation by SLR Data

*Yuki Akiyama, Sachiyo Kasho, Masato Watanabe, Shinichi Nakamura

Japan Aerospace Exploration Agency

Session r-3) Mar 2 (Wed) 11:00 - 12:40 [Conference Room]

Collision Avoidance, Modelling, Space Traffic Management

Chairpersons: Toshiya Hanada (Kyushu University)
Yukihito Kitazawa (Japan Aerospace Exploration Agency)

2022-r-09 (11:00 - 11:20)

RABBIT, a space debris collision avoidance tool ~ for satellite's safety operation ~

*Arimi Uemoto, Yuki Akiyama, Shinichi Nakamura

JAXA

2022-r-10 (11:20 - 11:40)

Development of Atmospheric Density Calibration and Preliminary Results

*Hideaki Hinagawa, Yuki Akiyama, Shinichi Nakamura

Japan Aerospace Exploration Agency

2022-r-11 (11:40 - 12:00)

Analysis of Orbit Propagation Error

*Kazunobu Takahashi, Yasuhiro Yoshimura, Hongru Chen, Toshiya Hanada

Kyushu Univ. Department of Aeronautics and Astronautics

2022-r-12 (12:00 - 12:20)

Environmental Impacts of GTO Objects on LEO

*Ryusuke Harada[1], Satomi Kawamoto[1], Nobuaki Nagaoka[1], Toshiya Hanada[2]

[1]Japan Aerospace Exploration Agency, [2]Kyushu Univ. Department of Aeronautics and Astronautics

2022-r-13 (12:20 - 12:40)

Space Traffic Management and Emerging Space Countries: a Right to Pollute?

*Quentin Verspieren

Graduate School of Public Policy, The University of Tokyo

Session r-4) Mar 2 (Wed) 16:00 - 17:00 [Conference Room]

Space Debris Removal

Chairpersons: Hironori Sahara (Japan Aerospace Exploration Agency)
Kumi Nitta (Japan Aerospace Exploration Agency)

2022-r-14 (16:00 - 16:20)

A De-Orbit Strategy with Reinforced Learning for Satellites Losing Attitude Control

*Masahiro Furumoto, Hironori Sahara

Tokyo Metropolitan Univ. Department of Aeronautics and Astronautics

2022-r-15 (16:20 - 16:40)

A Post Mission Disposal Strategy for Small Satellites without Complete Attitude Control

*Momoko Asano, Masahiro Furumoto, Hironori Sahara

Tokyo Metropolitan Univ. Department of Aeronautics and Astronautics

2022-r-16 (16:40 - 17:00)

Selection of Targets to Be Removed with Considering Timeliness

*Takahiro Maruyama[1], Hongru Chen[1], Yasuhiro Yoshimura[1], Satomi Kawamoto[2], Toshiya Hanada[1]

[1]Kyushu Univ. Department of Aeronautics and Astronautics, [2]JAXA Research and Development Directorate

Session t-1) Mar 3 (Thu) 16:00 - 16:45 [Meeting Room33]

Satellite Data Application

Chairperson: Masanori Kawamura (MELCO)

2022-t-01 (16:00 - 16:15)

In-Company-Activity to Create Innovative Applications using Satellite Information using "System x Design Thinking" - Insights from Six-Year-Long Mitsubishi Design Project

Shoji Yoshikawa[1], Akihiko Honda[1], *Masanori Kawamura[1], Mao Konishi[1], Tomoko Tanabe[1], Komi Matsubara[2], Kazuyuki Kikuchi[3], Fumihito Oura[4], Tsuyoshi Hirose[4], Makoto Ioki[4]

[1]Mitsubishi Electric Corp. Advanced Technology R& D Center, [2]Mitsubishi Electric Corp. Integrated Design Center, [3]Mitsubishi Electric Corp. Kobe Works, [4]Keio Univ. Graduate School of System Design and Management

2022-t-03 (16:15 - 16:30)

Embedding Machine learning for Spacecraft Simulations

*Samir Khan[1], Seiji Tsutsumi[2], Takehisa Yairi[1], Shinichi Nakasuka[1]

[1]University of Tokyo, [2]Jaxa

2022-t-04 (16:30 - 16:45)

Dictionary Learning on Satellite Housekeeping Data: Profiling, Imputation, Novelty Detection

*Ryosuke Tanida[1], Chun Fui Liu[2], Takehisa Yairi[2], Yusuke Fukushima[2]

[1]The University of Tokyo. Department of Aeronautics and Astronautics,
[2]The University of Tokyo. Research Center for Advanced Science and Technology

Session t-2) Mar 4 (Fri) 9:00 - 10:15 [Meeting Room33]

Systems Engineering for Satellite Design

Chairperson: Ryohei Takahashi (University of Tokyo)

2022-t-05 (9:00 - 9:15)

Knowledge Moleculization and Its Application to Efficient Reuse of Knowledge for Space Systems Development

*Ryohei Takahashi, Toshihiro Obata, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

2022-t-06 (9:15 - 9:30)

A Case Study on Quantitative Impact Assessment of Regressive Process by using Worker-Hour in Systems Engineering Process for Satellite Development

*Yoshinobu Okano, Hironori Sahara

Tokyo Metropolitan University

2022-t-07 (9:30 - 9:45)

Fault Diagnosis by Using Information Transmission Path Model and Its Application to an Earth Orbiting 6U CubeSat

*Shingo Nishimoto[1], Ryohei Takahashi[1], Shintaro Nakajima[2], Ryu Funase[1], Shinichi Nakasuka[1]

[1]The Univesity of Tokyo, Department of Aeronautics and Astronautics, [2]JAXA, Institute of Space and Astronautical Science

2022-t-08 (9:45 - 10:00)

A Case Study to Develop Systems Engineering Tools for Enhancing Reliability and Efficiency of CubeSat Design and Development

*Ryohei Takahashi, Masahiro Fujiwara, Shunichiro Nomura, Taiki Karakawa, Shingo Nishimoto, Keidai Iiyama, Kanta Yanagida, Akihiro Ishikawa, Shuhei Matsushita, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

2022-t-09 (10:00 - 10:15)

Snippet Based Electronics Design for Spacecraft Avionic Controllers

*Niklas Aksteiner, René Schulz, Janis Sebastian Häseker

Institute of Space Systems, German Aerospace Center (DLR)

Session t-3) Mar 4 (Fri) 11:00 - 12:15 [Meeting Room33]

Model Based Systems Engineering

Chairperson: Yuuki Tomita (JAXA)

2022-t-10 (11:00 - 11:15)

Model-Based Development Method Construction Utilizing Multi-Physics System-Level Modeling and Simulation towards Automatic Docking System Demonstration on HTV-X

*Kaname Kawatsu[1], Tadashi Masuoka[1], Kenta Nagahama[1], Yuki Tomita[1], Takashi Uchiyama[1], Takara Tanaka[2], Koshiro Usuku[2], Jun Sasaki[2]

[1]Japan Aerospace Exploration Agency, [2]IHI-Aerospace

2022-t-11 (11:15 - 11:30)

Behavior Analysis and Integration of HTV-X Automated Docking Demonstration Mission with Model Based Systems Engineering Approach

*Yuki Tomita[1], Hiroki Umeda[1], Kaname Kawatsu[1], Shunsuke Iwai[2], Koshiro Usuku[3], Daisuke Tsujita[4], Hideki Nomoto[5], Shohma Takatsuki[1], Masatoshi Horikawa[1], Takashi Uchiyama[1], Maki Maeda[1]

[1]Japan Aerospace Exploration Agency, [2]Mitsubishi Electric Corporation, [3]IHI Aerospace Corporation, [4]Mitsubishi Heavy Industries, Ltd, [5]Japan Manned Space Systems Corporation

2022-t-12 (11:30 - 11:45)

Novel Design Methodology of Satellite FDIR Architecturewith Trade-off Between Reliability and Complexity

*Taiki Karakawa, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

2022-t-13 (11:45 - 12:00)

Framework for Model-Based Approach of Life Cycle Risk Management for Spacecraft Liquid Propulsion System

*Kaname Kawatsu[1,2], Yu-ichiro Izato[2], Atsumi Miyake[2]

[1]Japan Aerospace Exploration Agency, [2]Yokohama National University

2022-t-14 (12:00 - 12:15)

Development of a Dynamic Response Model Considering Trapped Gas Effect for Spacecraft Liquid Propulsion Systems

*Himeko Yamamoto, Kaname Kawatsu, Yu Daimon, Go Fujii

Research and Development Directorate, JAXA

Session u-1) Feb 28 (Mon) 15:40 - 16:20 [Meeting Room33]

STEM and outreach

Chairperson: Kaori Sasaki (JAXA)

2022-u-01 (15:40 - 16:00)

Lecture on Satellites at Cosmic Academy for Kids -Implementing Online Courses for Elementary and Junior High School Parents and Children-

*Toshiaki Iwata[1,2], Tomoko Ito[2]

[1]Secondlife Activation Academy, [2]Cosmic Academy for Kids

2022-u-03 (16:00 - 16:20)

Career Path Project for Tsukuba Technical High School Using Space Technology

*Toshiaki Iwata[1], Toshio Kameda[2], Hiroyuki Ienaka[3], Takayuki Suzuki[3], Satoshi Suzuki[3], Keita Hagiya[3]

[1]Secondlife Activation Academy, [2]Warpspace Inc., University of Tsukuba, Faculty of Engineering, Information and Systems, [3]Tsukuba Technical High School

Session u-2) Mar 1 (Tue) 9:00 - 9:40 [Meeting Room33]

New appoach in space education

Chairpersons: Mohammed Khalil Ibrahim (Egyptian Space Agency)
Rei Kawashima (University Space Engineering Consortium)

2022-u-06 (9:00 - 9:20)

UNISEC-Global Initiative on Government Policies in Support of Space Education

*Quentin Verspieren[1], Rei Kawashima[2], Nate Taylor[2]

[1]Graduate School of Public Policy, The University of Tokyo, [2]UNISEC-Global, Japan

2022-u-08 (9:20 - 9:40)

Application of the Astronaut Training for Building Teamwork in Remote Work

*Nobuaki Minato[1], Ryo Sakurai[2], Kazuya Kito[1], Kohei Sasazawa[1], Tomoya Fukushima[1], Kenji Yamagata[3]

[1]Ritsumeikan Univ. Graduate School of Technology Management, [2]Ritsumeikan Univ. College of Policy Science, [3]Japan Aerospace Exploration Agency

Session u-3) Mar 1 (Tue) 11:00 - 12:00 [Meeting Room33]

Hands-on Education with hybrid rocket

Chairpersons: Akihiro Iwasaki (Yspace INC)
Yutaka Wada (Chiba institute of technology)

2022-u-10 (11:00 - 11:20)

Aerodynamic Roll Attitude Control Using Movable Fins in Students' Hybrid Rocket Missions

*Yasuaki Sakamoto, Kazuhide Kuroda, Shunsuke Onibuchi, Susumu Hara

Nagoya University

2022-u-11 (11:20 - 11:40)

A Study on Influences of Nozzle Throats and Oxygen Quantity on Combustion Performance of a Proposed Hybrid Rocket using a Plastic-bottle as an Educational Material

Masaya Nakahara[1], *Koichi Yamaguchi[1], Kazuki Nishida[1], Fumiaki Abe[1], Kenichi Tokunaga[1], Atsushi Ishihara[2]

[1]Ehime University, [2]Saitama Institute of Technology

2022-u-12 (11:40 - 12:00)

Development of Hybrid Rocket Engine using Saccharide by High School Students

Tomoyasu Tanigawa, *Riichi Ohta, Toshiyuki Sakita

Hyogo prefectural Sumoto Senior High School

Session u-4) Mar 1 (Tue) 16:00 - 17:20 [Meeting Room33]

Education with Nanosatellites

Chairpersons: Masahiko Yamazaki (Nihon University)
Hironori Sahara (Tokyo Metropolitan University)

2022-u-13 (16:00 - 16:20)

Cultivation of Space Human Resources by Nationwide KOSEN Online Lectures and Idea Contest to Develop Mission Planning Ability

*Makoto Wakabayashi[1], Kazumasa Imai[2], Masafumi Imai[1], Masahiro Tokumitsu[3], Jun Nakaya[4], Yukikazu Murakami[5], Nobuto Hirakoso[6], Taku Takada[7], Kazuo Shimada[8]

[1]National Institute of Technology (KOSEN), Niihama College, [2]National Institute of Technology (KOSEN), Kochi College, [3]National Institute of Technology (KOSEN), Yonago College, [4]National Institute of Technology (KOSEN), Gifu College, [5]National Institute of Technology (KOSEN), Kagawa College, [6]National Institute of Technology (KOSEN), Gunma College, [7]Tokyo Metropolitan College of Industrial Technology, [8]Human Network KOSEN

2022-u-14 (16:20 - 16:40)

Three-year Achievements in Human Resource Development Program in Space Engineering

*Kentaro Kitamura[1], Mitsumasa Ikeda[2], Sei-ichiro Miura[2], Kazumasa Imai[3], Taku Takada[4], Makoto Wakabayashi[5], Yoshihiro Kajimura[6], Nobuto Hirakoso[7], Manabu Shinohara[8], Masahiro Tokumitsu[9], Jun Nakaya[10], Yukikazu Murakami[11], Yoshihiro Kakinami[12]

[1]Kyushu Institute of Technololgy, [2]NIT, Tokuyama College, [3]Kochi College, [4]Tokyo Metropolitan College of Inds. Tech., [5]NIT, Niihama College, [6]NIT, Akashi College, [7]NIT, Gunma College, [8]NIT, Kagoshima College, [9]NIT, Yonago College, [10]NIT, Gifu College, [11]NIT, Kagawa College, [12]Hokkaido Information Univ.

2022-u-16 (16:40 - 17:00)

Proposal and Practice of Knowledge Management Methodology Incorporating Model-Based Systems Engineering in Satellite Development

*Takumi Sato, Taiga Zengo, Masahiko Yamazaki

Nihon University. Graduate School of Science and Technology Department of Aerospace Engineering

2022-u-17 (17:00 - 17:20)

Contribution of Academic and Research Collaborations to Diplomacy and Trade: Examples and Lessons from Space Capacity Building

*Quentin Verspieren[1,2], Xuan Phong Do[2,3], Naoko Shimmi[1], Yuichiro Nagai[1,4], Shinichi Nakasuka[2], Hideaki Shiroyama[1,5]

[1]Graduate School of Public Policy, The University of Tokyo, [2]Graduate School of Engineering, The University of Tokyo, [3]Vietnam National Space Center, Vietnam Academy of Science and Technology, Vietnam, [4]College of International Relations, Nihon University, [5]Graduate Schools for Law and Politics, The University of Tokyo

Session v-1) Mar 1 (Tue) 9:00 - 10:40 [Meeting Room3]

Space Policy, Security and History

Chairpersons: Hirotaka Watanabe (Osaka University)
Yasuaki Hashimoto (National Institute for Defense Studies)

2022-v-01 (9:00 - 9:25)

The Evolution of Japan's Space Policy and Organizations: Domestic, Diplomatic and Security Challenges

*Hirotaka Watanabe

Osaka University

2022-v-02 (9:25 - 9:50)

History of Japanese Security Space Activities

*Yasuaki Hashimoto

The National Institute for Defense Studies

2022-v-03 (9:50 - 10:15)

Past, Present, and Future of Military Use of Space: From the Perspective of Space Power Theories

*Yasuhito Fukushima

National Institute for Defense Studies, Japan

2022-v-04 (10:15 - 10:40)

The Efforts of Private Sector in Space Governanace

*Yuichiro Nagai

Nihon University College of International Relations

Session v-2) Mar 1 (Tue) 11:00 - 12:15 [Meeting Room3]

Space Law

Chairpersons: Yasuaki Hashimoto (National Institute for Defense Studies)
Masahiko Sato (Japan Aerospace Exploration Agency)

2022-v-05 (11:00 - 11:25)

The History of the Legal System concerning Space Activities in Japan

*Masahiko Sato

JAXA, Evaluation and Audit Department

2022-v-06 (11:25 - 11:50)

A Wholistic Approach for Understanding the Current Space Law and Policy

*Yu Takeuchi

Japan Aerospace Exploration Agency

2022-v-07 (11:50 - 12:15)

Some consideration for immunity and third party liability concerning the outer space activity of private company

*Hajime Shinomiya

Japan Aerospace Exploration Agency

Session v-3) Mar 1 (Tue) 16:00 - 17:40 [Meeting Room3]

Space Business and Governance

Chairpersons: Souichirou Kozuka (Gakushuin University)
Masahiko Sato (Japan Aerospace Exploration Agency)

2022-v-09 (16:00 - 16:25)

Space Investment To Encourage to Growth of Space Economy

*Misuzu Onuki

Space Access Corporation

2022-v-10 (16:25 - 16:50)

Avatar Collaboration in Space: Opportunities and Challenges of Technology and Business Development

*Naoko Sugita[1], Chiaki Ichikawa[2]

[1]Japan Aerospace Exploration Agency, [2]Japan Aerospace Exploration Agency

2022-v-11 (16:50 - 17:15)

Risk Governance of Outer Space and Cyberspace: Managing new risks and threats in coordination with commercial actors and international partners

*Masanori Muto, Yuki Kokubo, Shodai Ishii

Mitsubishi Research Institute

2022-v-12 (17:15 - 17:40)

Building Lunar and CisLunar Governance for Sustainable Space Operations partnering with Private Sector

*Yuki Kokubo, Shodai Ishii, Masanori Muto

Mitsubishi Research Institute

Session w-1) Mar 4 (Fri) 9:00 - 10:20 [Meeting Room1]

Safety&Reliability

Chairpersons: Hiroyuki Shindou (JAXA)
Ryoji Kobayashi (JAXA)

2022-w-01 (9:00 - 9:20)

Development of Autonomous Flight Termination Software

*Takafumi Akiyama, Toru Ishikawa, Naomi Ohbuchi, Naomasa Dairaku

Advanced Technology Development Group, Department of Space System Technology, Space Engineering Development Co., Ltd.

2022-w-02 (9:20 - 9:40)

Comprehensive Safety Design for Time-critical HTV-X Automated Docking Operations

*Daisuke Tsujita[1], Hiroshi Kozawa[2], Hideki Nomoto[3], Yuki Tomita[4], Shunsuke Iwai[5], Koshiro Usuku[6], Takashi Uchiiyama[4], Maki Maeda[4]

[1]Mitsubishi Heavy Industry. Ltd, [2]MHI Aerospace Systems Corporation, [3]Japan Manned Space Systems Corporation, [4]Japan Aerospace Exploration Agency, [5]Mitsubishi Electric Corporation, [6]IHI Aerospace Corporation

2022-w-03 (9:40 - 10:00)

JAXA/ISAS Safety Review and Safety Requirement of Sounding Rocket

*Akihide Kobayashi[1], Koichi Suzuki[2]

[1]Safety and Mission Assurance, JAXA, Sagamihara, Japan
[2]Safety and Mission Assurance officer, JAXA, Japan

2022-w-04 (10:00 - 10:20)

Cable Electrostatic Discharge (ESD)

*Hiroshi KINODA, Seiichiroh KAN, Tsuyoshi ITO

JAXA

Session w-2) Mar 4 (Fri) 11:00 - 12:20 [Meeting Room1]

EEE parts

Chairpersons: Shuji Araki (JAXA)
koji Oga (JAMSS)

2022-w-05 (11:00 - 11:20)

Space Environment Tolerance of High-Density Mounting Technology

*Koichi Shinozaki, Masao Suzuki

Japan Aerospace Exploration Agency

2022-w-06 (11:20 - 11:40)

Au Wire Bonding Applicability in Integrated Circuits for Space Applications

*Shouichi Terada, Koichi Suzuki

JAXA Safety and Mission Assurance Department

2022-w-07 (11:40 - 12:00)

Experimental Approach to Make an Evaluation Guideline of Space Usable COTS

*Akifumi Maru, Koichi Suzuki

JAXA Safety and Mission Assurance Department

2022-w-08 (12:00 - 12:20)

The Online Qualification Review of JAXA EEE parts Qualification System

*Koichi Suzuki

JAXA

Finalist Student Session

Session s-1) **Mar 3 (Thu) 9:00 - 10:30 [Meeting Room2]**

Finalist Student Session 1

Chairpersons: Yuichi Ikeda (Shonan Institute of Technology)
Yasuhiro Yoshimura (Kyushu University)

2022-d-69s (9:00 - 9:15)

Bifurcated Quasi-Satellite Orbits for Martian Moons eXploration (MMX)

*Nishanth Pushparaj[1], Yasuhiro Kawakatsu[2]

[1]Department of Space and Astronautical Science, The Graduate University for Advanced Studies, SOKENDAI,
[2]Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency

2022-d-70s (9:15 - 9:30)

Research for Real-Time onboard Precise Orbit Determination using Precise Point Positioning

*Yoshinari Gyu, Satoshi Ikari, Ryu Funase, Shinichi Nakasuka

The University of Tokyo

2022-d-71s (9:30 - 9:45)

Landing Guidance Control Combining Powered Descending with Nonlinear Optimization and Vertical Descending with Model Prediction

*Yusuke Nakatsuka, Satoshi Satoh, Katsuhiko Yamada

Osaka Univ. Department of Mechanical Engineering

2022-d-72s (9:45 - 10:00)

Round Trip Trajectory Design by Trajectory Parts Connecting Method

*Daichi Ito[1], Yasuhiro Kawakatsu[2]

[1]The Graduate University for Advanced Studies, [2]Japan Aerospace Exploration Agency

2022-d-73s (10:00 - 10:15)

Robust Hybrid Decentralized Filter for Relative Navigation for Spacecraft Swarms

*Nobuhiro Funabiki, Satoshi Ikari, Ryu Funase, Shinichi Nakasuka

The University of Tokyo. Department of Aeronautics and Astronautics

2022-d-74s (10:15 - 10:30)

Integrated Optimization of Guidance and Navigation Scheduling for Deep Space Exploration via Stochastic Trajectory Optimization Approach

*Kota Kakihara[1], Naoya Ozaki[2], Akihiro Ishikawa[1], Takuya Chikazawa[3], Shinichi Nakasuka[1], Ryu Funase[1]

[1]Department of Aeronautics and Astronautics, The University of Tokyo, [2]Institute of Space and Astronautical Science,
Japan Aerospace Exploration Agency, [3]Department of Advanced Energy, The University of Tokyo

Session s-2) Mar 3 (Thu) 10:50 - 12:35 [Meeting Room2]

Finalist Student Session 2

Chairpersons: Hiraku Sakamoto (Tokyo Institute of Technology)
Tomohiro Yokozeki (The University of Tokyo)

2022-a-36s (10:50 - 11:05)

Effect of Concentration of H_2O_2 on Burning Characteristics of H_2O_2-soaked Polyethylene Foam

*Daiki Matsugi, Yuji Nakamura

Toyohashi University of Technology, Department of Mechanical Engineering

2022-a-37s (11:05 - 11:20)

Investigation of Combustion Instability in a Hydrogen-fueled Model Ram Combustor of Pre-cooled Turbojet Engine

*Koichi Omi[1], Kotaro Yoshihara[1], Daiki Ito[1], Hideyuki Taguchi[2], Shinji Nakaya[1], Mitsuhiro Tsue[1]

[1]The University of Tokyo. Department of Aeronautics and Astronautics, [2]Japan Aerospace Exploration Agency

2022-a-38s (11:20 - 11:35)

Experimental Study on Airflow Mixing with a Lobed Mixer

*Tomoaki Kaneta[1], Katsuyoshi Fukiba[1], Yusuke Maru[2]

[1]Shizuoka Univ. Department of Mechanical Engineerings, [2]Japan Aerospace Exploration Agency (JAXA)

2022-a-39s (11:35 - 11:50)

Experimental Investigation of Hybrid Rocket Acoustics

*Shintaro Nakamura[1], Mikiya Araki[1], Juan C. González Palencia[1], Koki Yamagishi[2], Kazuki Yasuda[2], Daisuke Nakata[2], Masaharu Uchiumi[2]

[1]Gunma University. Graduate School of Science and Technology, [2]Muroran Institute of Technology. Division of Aerospace Engineering

2022-c-28s (11:50 - 12:05)

Parametric Design Modeling in Form Finding for a deployable Structure on the Moon

*Luciana Tenorio[1], Jun Sato[2], Tomohiro Yokozeki[1]

[1]The University of Tokyo Department of Aeronautics and Astronautics, [2]The University of Tokyo Graduate School of Frontier Sciences

2022-n-25s (12:05 - 12:20)

Coastline Change Detection Based on Sentinel-2 Imagery data in Jembrana Regency, Bali Province

*Amandangi Wahyuning Hastuti[1,2], Masahiko Nagai[1,3], Komang Iwan Suniada[2]

[1]Graduate School of Science and Technology for Innovation, Yamaguchi University, [2]Institute for Marine Research and Observation, Ministry of Marine Affairs and Fisheries Republic of Indonesia, [3]Center for Research and Application of Satellite Remote Sensing, Yamaguchi University

2022-t-15s (12:20 - 12:35)

Investigation of Anomaly Detection Method Using an Index of the System Health

*Shun Katsube, Hironori Sahara

Tokyo Metropolitan Univ. Department of Aeronautics and Astronautics

Session s-3) Mar 3 (Thu) 16:00 - 17:30 [Meeting Room2]

Finalist Student Session 3

Chairpersons: Yutaka Wada (Chiba institute of technology)
Junichiro Aoyagi (University of Yamanashi)

2022-v-13s (16:00 - 16:15)

Neo-Realism and US Space Policies, Capabilities and Endeavours

*Munazza Khalid

Quaid-I-Azam University, Islamabad, Pakistan,
Air University, Islamabad, Pakistan

2022-b-51s (16:15 - 16:30)

Thruster Development and Plasma Diagnostics of Microwave Discharge Ion Thruster

*Yusuke Yamashita[1], Ryudo Tsukizaki[2], Kazutaka Nishiyama[2]

[1]Tokyo Univ. Department of Aeronautics and Astronautics, [2]JAXA. Institute of Space and Astronautical Science

2022-b-52s (16:30 - 16:45)

Laser-Induced Fluorescence Measurements of a Visualized Microwave Cathode

*Takato Morishita[1], Ryudo Tsukizaki[2], Kazutaka Nishiyama[2], Hitoshi Kuninaka[2]

[1]The University of Tokyo, [2]Japan Aerospace Exploration Agency

2022-b-53s (16:45 - 17:00)

Experimental Prediction of Performance Degradation during Space Operation in Thrust-enhanced Microwave Discharge Ion Thruster μ10

*Kana Hattori[1], Yusuke Yamashita[1], Ryo Shirakawa[2], Satoshi Hosoda[3], Ryudo Tsukizaki[3], Kazutaka Nishiyama[3]

[1]The University of Tokyo. Department of Aeronautics and Astronautics, [2]Kobe University. Department of Mechanical Engineering,
[3]JAXA. Institute of Space and Astronautical Science

2022-e-36s (17:00 - 17:15)

Preliminary Experiments of Supersonic Microjets by TGI

*Tenta Tashiro[1], Shinichiro Nakao[1], Yoshiaki Miyazato[1], Yojiro Ishino[2]

[1]The University of Kitakyushu. Department of Mechanical Systems Engineering,
[2]Nagoya Institute of Technology. Department of Mechanical Engineering

2022-e-37s (17:15 - 17:30)

Electron Density Measurement in front of and behind the Shock Wave by a Laser Interferometer with a Variable Optical Path Length

*Tatsuru Ishikawa[1], Makoto Matsui[1], Satoshi Nomura[2], Kazuhisa Fujita[2]

[1]Shizuoka University, [2]JAXA

Technical Session Poster

Poster Session **Mar 3 (Thu) 18:00 - 20:00 [Entrance Hall]**

2022-b-54p (18:00 - 20:00)

Study on Thermal Efficiency of Laser-Supported Detonation by p-v and Q-W Diagrams

*Ichiro Nakano, Hiroyuki Shiraishi

Daido University

2022-b-55p (18:00 - 20:00)

Computational and Experimental Study on the Electrohydrodynamic and Thermal Effects of DBD Plasma Actuator

*Yutaka Kaneko, Hiroyuki Nishida, Yoshiyuki Tagawa

Tokyo University of Agriculture and Technology. Department of Mechanical Systems Engineering

2022-b-57p (18:00 - 20:00)

Beam-riding Characteristic Evaluation on Multi-parabola Thruster Using Pendulum-type Measurement System

*Masayuki Takahashi[1], Kenichiro Ashikawa[1], Koichi Mori[2], Naofumi Ohnishi[1]

[1]Tohoku Univ. Department of Aerospace Engineering, [2]Osaka Metropolitan Univ. Department of Aerospace Engineering

2022-b-59p (18:00 - 20:00)

Performance and Grid Erosion of a Miniature Water Ion Thruster during an Ongoing Long-duration Test

*Fuya Ezuka[1], Yuichi Nakagawa[2], Daiki Tomita[2], Kazuya Yaginuma[2], Jun Asakawa[2], Hiroyuki Koizumi[1], Kimiya Komurasaki[3]

[1]University of Tokyo Department of Advanced Energy, [2]Pale Blue Inc., [3]University of Tokyo Department of Aeronautics and Astronautics

2022-b-60p (18:00 - 20:00)

Triple-probe Measurement for Microwave Discharge in Beam using 28 GHz Gyrotron

*Tatsuki Hirano, Kaisei Miyawaki, Maho Matsukura, Kohei Shimamura, Shigeru Yokota, Ryutaro Minami, Tsuyoshi Kariya

University of Tsukuba

2022-b-62p (18:00 - 20:00)

Study of the JXB Arc Thruster to Develop Low-Cost Space-Transporters

*Tetsu Mieno[1,2], Mikihito Tanaka[1], Yoshitaka Hisanaga[1]

[1]Faculty of Science, Shizuoka University, [2]Graduate School of Science & Technology, Shizuoka University

2022-b-65p (18:00 - 20:00)

Experimental Investigation of Plasma Parameter inside a Miniature Ion Thruster Using Langmuir Probe

*Ataka Yasuho, Hiroyuki Koizumi, Kimiya Komurasaki

The University of Tokyo

2022-b-66p (18:00 - 20:00)

Experimental investigation of Magnetic Field Effect on Electron Transport in a Miniature Microwave Discharge Neutralizer

*Ryo Minematsu, Hokuto Sekine, Yasuho Ataka, Hiroyuki Koizumi, Kimiya Komurasaki

The University of Tokyo

2022-d-75p (18:00 - 20:00)

Study of Cubesat Attitude Stabilization using Low Power MTQ

*Dulani Chamika Withanage, Mengu Cho, Mariko Teramoto, Sangkyun Kim, Hirokazu Masui, Abhas Maskey, Yuta Kakimoto, Yuji Sasaki, Makiko Kishimoto, Tharindu Lakmal Dayarathna Malmadayalage, Hari Ram Shrestha, Pooja Lepcha

Kyushu Institute of Technology

2022-d-76p (18:00 - 20:00)

Model Predictive Control for Planetary Landing Considering On-off Input Constraint

*Takefumi Kosaka, Yusuke Ozawa, Toshio Kamiya

Space Systems Division, NEC Corporation, Tokyo, Japan

2022-d-77p (18:00 - 20:00)

Development Status Report of Sample Return Capsule for MMX

*Takayuki Shimoda, Toshiyuki Suzuki, Kazuhiko Yamada, Daisuke Nakayama, Takashi Ozawa, Hiroki Takayanagi, Hirokazu Adachi, Tatsuro Nakao, Yuma Yagi, Hiroshi Yagasaki

Japan Aerospace Exploration Agency

2022-d-78p (18:00 - 20:00)

Optimal Transfer Trajectory Analysis of Relative QSOs around Phobos

*Nishanth Pushparaj[1], Nicola Baresi[2], Yasuhiro Kawakatsu[3]

[1]The Graduate University for Advanced Studies, SOKENDAI, [2]University of Surrey, [3]Japan Aerospace Exploration Agency

2022-e-38p (18:00 - 20:00)

Verification for Validity of the Flow Field behind the Shock Wave after through the Density Modulated Field

*Syuusuke Hishida[1], Kazuma Mori[1], Taisei Hukuyo[1], Tomoki Inoue[2], Atsushi Matsuda[1]

[1]Meijo University, [2]Toshiba Infrastructure Systems & Solutions Corporation

2022-e-39p (18:00 - 20:00)

Fluid-Structure Interaction Simulation for Estimating the Deformation of the Ballutes for Re-entry Vehicles in Supersonic Regime

Hirotaka Otsu, *Shinichiro Mekata, Tomoya Fukumoto, Yuya Oshio

Ryukoku University

2022-e-40p (18:00 - 20:00)

Experimental Investigation of Deformation of the Ballutes for Re-entry Vehicles in Supersonic Regime

Hirotaka Otsu, *Tomoya Fukumoto, Shinichiro Mekata, Yuya Oshio

Ryukoku University

2022-e-41p (18:00 - 20:00)

Numerical Investigation of Aerodynamic Characteristics of a Re-entry Capsule with Hyperbolic Contours

Hirotaka Otsu, *Masaya Nagasawa, Ryoga Tsujimoto, Yuya Oshio

Ryukoku University

2022-e-42p (18:00 - 20:00)

Experimental Investigation of Aerodynamic Characteristics of a Re-entry Capsule with Hyperbolic Contours

Hirotaka Otsu, *Ryoga Tsujimoto, Masaya Nagasawa, Yuya Oshio

Ryukoku University

2022-e-43p (18:00 - 20:00)

Arc Heating Supersonic Test for SiC

*Koya Minami[1], Kazutaka Kitagawa[2], Makoto Takagi[2]

[1]Graduate student, Dept. of Mechanical Engng., Aichi Institute of Technology (AIT),
[2]Dept. of Mechanical Engng., Aichi Institute of Technology (AIT)

2022-e-44p (18:00 - 20:00)

Effects of Interference Between Two Facing Plasma Actuators on Their Performance Characteristics

*Takafumi Saito, Hiroyuki Nishida, Yutaka Kaneko, Yusuke Kakuya

Tokyo University of Agriculture and Technology. Department of Mechanical Systems Engineering

2022-e-45p (18:00 - 20:00)

Flow Diagnostics by Laser Absorption Spectroscopy Using Multi-pass Cell in Expansion Tube

*Kota Gunji[1], Ryuji Kobayashi[2], Makoto Matsui[1], Kazuhiko Yamada[3]

[1]Shizuoka Univ. Department of Mechanical Engineering, [2]Shizuoka Univ. Department of Engineering, [3]JAXA/ISAS

2022-g-18p (18:00 - 20:00)

Study on Orbit Control of Orbital Elevator by Propulsion System and Variable Length Tether

*Ren Terada[1], Yoshiki Yamagiwa[1], Shoko Arita[1], Yoji Ishikawa[2], Kiyotoshi Otsuka[2]

[1]Shizuoka University, [2]Obayashi Corporation

2022-g-19p (18:00 - 20:00)

Analytical Study of the Dynamics of Lunar Space Elevator with considering the Ellipticity of the Orbit

*Ryota Kato[1], Yoshiki Yamagiwa[1], Shoko Arita[1], Yoji Ishikawa[2], Kiyotoshi Otsuka[2]

[1]shizuoka university, [2]Obayashi Corporation

2022-j-13p (18:00 - 20:00)

Implementation of the method to estimate the propagation direction of laser beam transmitted from ground to satellite

*Tatsuki Ikeuchi, Hiroki Yamashita, Hiroyuki Sato, Yoshihisa Takayama

Tokai University

2022-j-14p (18:00 - 20:00)

Acquisition of communicating partner by retroreflection of transmitted optical beam

*Akihiro Omura[1], Hiroki Yamashita[1], Yosihisa Takayama[1], Norihito Yanagimoto[2], Jyunichi Nakajima[2]

[1]Tokai University, [2]SoftBank Corp

2022-j-15p (18:00 - 20:00)

System Design and Model Comparisons of High-Speed Data Relay Infrastructure Using Optical Communication Between Earth and Moon

*Ryuichi Hirayama, Shinichi Nakasuka

The University of Tokyo. Department of Aeronautics and Astronautics

2022-m-18p (18:00 - 20:00)

Electric Field Observation during the Medium-Scale Traveling Ionospheric Disturbance occurrence by the S-520-32 Sounding Rocket

*Miyuki Matsuyama[1], Keigo Ishisaka[1], Yuki Ashihara[2]

[1]Toyama Prefectural University, [2]National Institute of Technology, Nara College

2022-m-19p (18:00 - 20:00)

DC Electric Field Measurements in the Cusp Region by SS-520-3 Sounding Rocket

*Keigo Ishisaka[1], Takahiro Zushi[2], Satoshi Kurita[3], Hirotsugu Kojima[3]

[1]Toyama Prefectural University, [2]National Institute of Technology, Nara College, [3]RISH, Kyoto University

2022-n-26p (18:00 - 20:00)

The Experiments on Corner Reflector for SAR Data Calibration at Yamaguchi University, Japan

*Nopphawan Tamkuan, Dorj Ichikawa, Vaibhav Katiyar, Masahiko Nagai, Yumiko Nagai, Tsuyoshi Eguchi

Yamaguchi University, Japan

2022-n-27p (18:00 - 20:00)

The relationship between aerosol and CO2 emissions from biomass burning

*Kazuhisa Tanada, Hiroshi Murakami

JAXA

2022-n-28p (18:00 - 20:00)

Overview and Updates of GCOM-W/AMSR2 and GOSAT-GW/AMSR3

*Rigen Shimada, Misako Kachi, Hideyuki Fujii, Keiichi Ohara, Kazuya Inaoka, Marehito Kasahara, Yasushi Kojima

Japan Aerospace Exploration Agency

2022-n-29p (18:00 - 20:00)

A Transfer Learning Approach for Flood Monitoring Among SAR Satellites

*Vaibhav Katiyar, Nopphawan Tamkuan, Dorj Ichikawa, Masahiko Nagai

Yamaguchi University, Japan

2022-n-30p (18:00 - 20:00)

Satellite Attitude Optimization for Automatic Earth Observation with Cloud Detecting CNN

*Takatomo Osaki, Takaya Inamori, Ji Hyun Park, Kohei Yamaguchi

Nagoya Univ. Department of engineering

2022-n-31p (18:00 - 20:00)

Evaluations of Long-term Trend of Total Precipitable Water Observed by the Japanese Spaceborne Microwave Radiometers

*Keiichi Ohara[1], Takuji Kubota[1], Misako Kachi[1], Masahiro Kazumori[2]

[1]Japan Aerospace Exploration Agency (JAXA). Department of Space Technology Directorate 1. Earth Observation Research Center (EORC)., [2]Japan Meteorological Agency (JMA)

2022-q-16p (18:00 - 20:00)

Evaluation for High-Rate Discharge Operation of Space Lithium Ion Cells

*Hitoshi Hitoshi, Makoto Kawase, Ken Watanabe, Ayaka Mori

Japan Aerospace Exploration Agency

2022-q-17p (18:00 - 20:00)

Development of High Energy Density Lithium Ion Cell for Lunar Exploration

*Ayaka Mori, Ken Watanabe, Makoto Kawase, Hitoshi Naito, Takeshi Hoshino

Japan Aerospace Exploration Agency

2022-r-19p (18:00 - 20:00)

Basic Research on Debris Deorbiting by Electric Thrusters and Electrodynamic Tethers, and Development of the 4th Osaka Sangyo University Nano-Satellite for Space Experiments

*Hirokazu Tahara[1], Takahiro Itsuki[2], Tomoyuki Ikeda[3], Yoshiyuki Takao[4], Takashi Wakizono[5], Tatsuo Onishi[6]

[1]Osaka Sangyo University, Department of Mechanical Engineering, [2]Osaka Sangyo University, Graduate School of Engineering, Division of Mechanical Engineering, [3]Tokai University, [4]Nishinippon Institute of Technology, [5]High Serve, Inc., [6]Massachusetts Institute of Technology

2022-r-21p (18:00 - 20:00)

Effects of Temperature on Ejecta from UHMwPE Fiber Composites/Aluminum Alloy Plates

*Daichi Kimura[1], Masahiro Nishida[1], Yukihiro Nomura[2]

[1]Nagoya Institute of Technology, Department of Electrical and Mechanical Engineering, [2]Toyobo Co., Ltd.

2022-r-22p (18:00 - 20:00)

Simulation Study on Radio Wave Scattering by Small Objects covered with a Charged Particle Layer

*Yohei Miyake[1,2], Junya Takagi[2], Nobuyuki Kaya[3]

[1]Education Center on Computational Science and Engineering, Kobe University, [2]Graduate School of System Informatics, Kobe University, [3]WaveArrays, Inc.

2022-r-23p (18:00 - 20:00)

Collision Avoiding Control of Space Debris Removal Satellites with Operational Satellites

*Noriyuki Nishijo, Hiroshi Hirayama

Department of System Design Engineering, Graduate School of Engineering Science, Akita University

2022-r-24p (18:00 - 20:00)

A Study on Attitude Motion Estimation of a Decommissioned Spacecraft in Nutation Motion

*Kanta Miyazaki[1,2,3], Katsuyoshi Tsujita[1,2,3]

[1]Osaka Institute of Technology, [2]Department of electrical, electronic and mechanical engineering, [3]Section of electrical and electronic engineering

2022-r-25p (18:00 - 20:00)

Quantitative Evaluation of Energy Distribution for Charged Particles Invading the Magnetic Shield for the Protection of Cosmic Rays

*Yoshihiro Kajimura[1], Morito Iizuka[1], Kazuki Akasaka[1], Yuya Oshio[2], Ikkoh Funaki[3]

[1]National Institute of Technology, Akashi College, Department of Electrical and Computer Engineering, [2]Ryukoku University, Faculty of Advanced Science and Technology, Course of Mechanical Engineering and Robotics, [3]Japan Aerospace Exploration Agency, Institute of Space and Astronautical Science

2022-r-27p (18:00 - 20:00)

Study of Voltage and Current Characteristics of Conductive Tape Tethers with Different Tape Widths and Surface Conditions

*Masahiko Tetsuya

Kyushu Institute of Technology Graduate School

2022-r-28p (18:00 - 20:00)

Development of Harpoon to Catch Space Debris

*Yasuhiro Akahoshi, Yuki Nakamura, Teo Lenormand

Kyushu Institute of Technology, Department of Space Systems Engineering

2022-r-29p (18:00 - 20:00)

Drag Force Evaluation of Large-Scale Charged Membrane for Space Debris Removal in Laboratory Experiment

*Kazuma Ueno[1], Takanobu Muranaka[1], Teppei Okumura[2], Yasushi Ohkawa[2]

[1]Chukyo University, School of Engineering, [2]Japan Aerospace Exploration Agency, Research and Development Directorate

Authors' Index

Name	Page	Paper No.	Date	Session No.
	43	2022-f-47	Mar 4	f-11
	43	2022-f-49	Mar 4	f-11
	44	2022-f-55	Mar 4	f-13
	44	2022-f-57	Mar 4	f-13
	44	2022-f-58	Mar 4	f-13
	48	2022-i-04	Mar 3	i-1
	48	2022-i-06	Mar 4	i-2
	59	2022-m-15	Mar 2	m-4
	68	2022-t-03	Mar 3	t-1
	68	2022-t-05	Mar 4	t-2
	68	2022-t-07	Mar 4	t-2
	69	2022-t-08	Mar 4	t-2
	69	2022-t-12	Mar 4	t-3
	72	2022-u-17	Mar 1	u-4
	76	2022-d-70s	Mar 3	s-1
	76	2022-d-73s	Mar 3	s-1
	76	2022-d-74s	Mar 3	s-1
	82	2022-j-15p	Mar 3	Poster Session
Nakata D.	1	2022-o-1-05	Mar 3	o-1-1
	1	2022-o-1-07	Mar 3	o-1-2
	3	2022-o-1-18	Mar 4	o-1-4
	13	2022-b-21	Mar 2	b-5
	13	2022-b-22	Mar 2	b-5
	58	2022-m-10	Mar 2	m-3
	58	2022-m-11	Mar 2	m-3
	58	2022-m-12	Mar 2	m-3
	58	2022-m-13	Mar 2	m-3
	77	2022-a-39s	Mar 3	s-2
Nakatsuka Y.	76	2022-d-71s	Mar 3	s-1
Nakatsukasa T.	35	2022-e-27	Mar 3	e-6
Nakaya J.	40	2022-f-23	Mar 2	f-5
	71	2022-u-13	Mar 1	u-4
	71	2022-u-14	Mar 1	u-4
Nakaya S.	45	2022-g-05	Mar 4	g-1
	47	2022-h-02	Mar 1	h-1
	77	2022-a-37s	Mar 3	s-2
Nakayama C.	28	2022-d-51	Mar 3	d-12
Nakayama D.	37	2022-f-06	Mar 1	f-2
	39	2022-f-21	Mar 2	f-5
	80	2022-d-77p	Mar 3	Poster Session
Nakayama K.	49	2022-i-07	Mar 4	i-2
Nakayama Y.	10	2022-b-03	Feb 28	b-1
	16	2022-b-44	Mar 4	b-11
	57	2022-m-09	Mar 2	m-2
Nakazawa S.	29	2022-d-56	Mar 3	d-13
	32	2022-e-04	Mar 2	e-1
	53	2022-k-19	Mar 2	k-5
Namba S.	15	2022-b-40	Mar 3	b-10
	15	2022-b-41	Mar 3	b-10
Namiki N.	53	2022-k-20	Mar 2	k-5
Nerome S.	42	2022-f-39	Mar 3	f-9
Nguyen T. D.	36	2022-e-32	Mar 4	e-7
Nikado H.	45	2022-g-03	Mar 4	g-1
Nikaido T.	51	2022-k-08	Mar 1	k-2
Nishida H.	14	2022-b-31	Mar 3	b-8
	14	2022-b-33	Mar 3	b-8
	14	2022-b-34	Mar 3	b-8
	16	2022-b-42	Mar 3	b-10
	34	2022-e-22	Mar 3	e-5
	36	2022-e-30	Mar 4	e-7
	79	2022-b-55p	Mar 3	Poster Session
	81	2022-e-44p	Mar 3	Poster Session
Nishida K.	71	2022-u-11	Mar 1	u-3
Nishida M.	83	2022-r-21p	Mar 3	Poster Session
Nishiguchi H.	6	2022-a-10	Mar 1	a-3
Nishii K.	4	2022-o-1-23	Mar 4	o-1-5
Nishijo N.	83	2022-r-23p	Mar 3	Poster Session
Nishikawa T.	31	2022-d-66	Mar 4	d-16
Nishimoto S.	48	2022-i-04	Mar 3	i-1
	68	2022-t-07	Mar 4	t-2
	69	2022-t-08	Mar 4	t-2
Nishimura A.	14	2022-b-28	Mar 2	b-7

Name	Page	Paper No.	Date	Session No.
Nishimura A.	41	2022-f-31	Mar 2	f-7
Nishimura K.	31	2022-d-65	Mar 4	d-16
Nishimura S.	20	2022-c-20	Mar 2	c-5
Nishio M.	40	2022-f-23	Mar 2	f-5
Nishioka K.	26	2022-d-35	Mar 2	d-8
Nishioka S.	65	2022-r-02	Mar 1	r-1
Nishiyama K.	10	2022-b-03	Feb 28	b-1
	10	2022-b-04	Feb 28	b-1
	31	2022-d-68	Mar 4	d-16
	55	2022-l-07	Mar 1	l-3
	78	2022-b-51s	Mar 3	s-3
	78	2022-b-52s	Mar 3	s-3
	78	2022-b-53s	Mar 3	s-3
Nishiyama M.	53	2022-k-19	Mar 2	k-5
Nitta K.	63	2022-p-03	Feb 28	p-1
Noda M.	7	2022-a-19	Mar 2	a-5
Noda T.	58	2022-m-10	Mar 2	m-3
	58	2022-m-11	Mar 2	m-3
	58	2022-m-12	Mar 2	m-3
	58	2022-m-13	Mar 2	m-3
Nogawa Y.	13	2022-b-21	Mar 2	b-5
Noguchi S.	53	2022-k-19	Mar 2	k-5
Noguchi T.	53	2022-k-20	Mar 2	k-5
Nohmi M.	29	2022-d-53	Mar 3	d-13
Nomoto H.	69	2022-t-11	Mar 4	t-3
	74	2022-w-02	Mar 4	w-1
Nomura S.	33	2022-e-13	Mar 2	e-3
	53	2022-k-19	Mar 2	k-5
	63	2022-p-03	Feb 28	p-1
	78	2022-e-37s	Mar 3	s-3
Nomura S.	69	2022-t-08	Mar 4	t-2
Nomura Y.	83	2022-r-21p	Mar 3	Poster Session
Nonaka M.	10	2022-b-06	Mar 1	b-2
	11	2022-b-14	Mar 1	b-3
	12	2022-b-17	Mar 1	b-4
Nonaka S.	45	2022-g-01	Mar 4	g-1
Nonaka T.	62	2022-n-23	Mar 3	n-5
Nono A.	10	2022-b-03	Feb 28	b-1
Nozawa H.	51	2022-k-07	Mar 1	k-2
Obana S.	49	2022-j-06	Mar 3	j-2
Obara I.	1	2022-o-1-05	Mar 3	o-1-1
Obata T.	28	2022-d-50	Mar 3	d-12
	68	2022-t-05	Mar 4	t-2
Oboshi A.	38	2022-f-14	Mar 1	f-3
Oda H.	47	2022-h-03	Mar 1	h-1
Oda T.	9	2022-a-32	Mar 3	a-8
Oda Y.	17	2022-b-48	Mar 4	b-12
Odagiri K.	48	2022-i-02	Mar 3	i-1
Ofosu J. A.	39	2022-f-21	Mar 2	f-5
	48	2022-i-05	Mar 3	i-1
Ogawa H.	15	2022-b-36	Mar 3	b-9
	35	2022-e-28	Mar 3	e-6
Ogawa H.	48	2022-i-01	Mar 3	i-1
	48	2022-i-02	Mar 3	i-1
Ogawa K.	22	2022-d-05	Feb 28	d-1
Ogawa N.	53	2022-k-18	Mar 2	k-5
Ogawa S.	16	2022-b-44	Mar 4	b-11
Ogawa Y.	66	2022-r-06	Mar 2	r-2
Ogimoto K.	40	2022-f-26	Mar 2	f-6
Oguro R.	61	2022-n-14	Mar 2	n-3
Ohara K.	82	2022-n-28p	Mar 3	Poster Session
	83	2022-n-31p	Mar 3	Poster Session
Ohbuchi N.	74	2022-w-01	Mar 4	w-1
Ohira G.	20	2022-c-18	Mar 1	c-4
	22	2022-d-04	Feb 28	d-1
	29	2022-d-55	Mar 3	d-13
Ohkawa Y.	10	2022-b-01	Feb 28	b-1
	84	2022-r-29p	Mar 3	Poster Session
Ohki M.	60	2022-n-08	Mar 2	n-2
Ohnishi N.	11	2022-b-09	Mar 1	b-2
	17	2022-b-50	Mar 4	b-12
	33	2022-e-15	Mar 3	e-4

Sponsors' List

33rd ISTS Sponsors' List

33rd ISTS Organizing Committee and Japan Society for Aeronautical and Space Science thank the following companies and organizations for their sponsorship and support.

As of February 14, 2022.

In alphabetical order

=Gold=

FUJITSU LIMITED
IHI AEROSPACE CO., LTD.
IHI Corporation
Japan Aerospace Exploration Agency
Mitsubishi Electric Corporation
Mitsubishi Heavy Industries, Ltd.
NEC Corporation

=Silver=

Kawasaki Heavy Industries, Ltd.
Mitsui Bussan Aerospace Co., Ltd.
NOF CORPORATION
Space BD Inc.

=Bronze=

Advanced Engineering Services Co., Ltd.
BCC CO., LTD.
Chiyoda Corporation
Churyo Engineering Co., Ltd.
COSMOTEC Co., Ltd.
DENKEN.Co.Ltd.
Fuji Electric IT Solutions Co., Ltd.
High-Reliability Engineering & Components Corporation
IHI Jet Service Co., Ltd.
Japan Aerospace Technology Foundation
Japan Manned Space Systems Corporation
Japan Space Forum
Japan Space Systems
JECC TORISHA Co.,Ltd.
KYOWA ELECTRONIC INSTRUMENTS CO., LTD.

KYUDENKO Corporation

LSAS Tec.,Co.Ltd.

Matsumoto Industrial Co., Ltd.

MEISEI ELECTRIC CO., LTD.

Mitsubishi Electric TOKKI Systems Corporation

Mitsubishi Precision Company, Limited

Mitsubishi Space Software Co.,Ltd.

NEC Aerospace Systems, Ltd.

NiGK Corporation

NIPPI Corporation

Nippon Records Management Co., Ltd.

Remote Sensing Technology Center of Japan

SEIREN CO.,LTD.

Sekishin Inc.

SKY Perfect JSAT Corporation

Society for Promotion of Space Science

SPACE ENGINEERING DEVELOPMENT Co., Ltd.

Space Service Co., Ltd.

SPC ELECTRONICS CORPORATION

SUBARU CORPORATION

The Society of Japanese Aerospace Companies

TIS Solution Link Inc.

TMI Associates

Tokio Marine & Nichido Fire Insurance Co., Ltd.

TOKYO COMPUTER SERVICE CO., LTD

33rd ISTS Organizing Committee Members' List

General Chairperson	Shinichi NAKASUKA	The University of Tokyo
Consultant	Tomonao HAYASHI	18th General Chairperson
	Ryojiro AKIBA	19th General Chairperson
	Tomifumi GODAI	20th General Chairperson
	Shigeaki NOMURA	21st General Chairperson
	Hiroki MATSUO	22nd General Chairperson
	Hirotoshi KUBOTA	23rd General Chairperson
	Susumu TODA	24th General Chairperson
	Yasunori MATOGAWA	25th General Chairperson
	Michikata KONO	26th General Chairperson
	Junjiro ONODA	27th General Chairperson
	Yoshihiro ARAKAWA	28th General Chairperson
	Masanori HOMMA	29th General Chairperson
	Kozo FUJII	30th General Chairperson
	Sei UENOya	31st General Chairperson
	Yasuhiro MORITA	32nd General Chairperson
Honorary Advisor	Katsusada HIROSE	Governor of Oita Prefecture
	Yasuhiro NAGANO	Mayor of Beppu City
Advisor	Hiroshi YAMAKAWA	JAXA
	Ryutaro KAWAMURA	NTT
	Toru KURODA	NHK
	Yasuyuki NAKAJIMA	KDDI

Program Committee

Chairperson of the Committee	Toru SHIMADA	JAXA
Co-Chairperson	Shinji NAKAYA	The University of Tokyo
Co-Chairperson	Yoshikazu SHOJI	JAXA
Co-Chairperson	Yuko INATOMI	JAXA
Co-Chairperson	Kenichi TAKAHASHI	Nihon University
	Naoya OZAKI	JAXA
	Hironori SAHARA	Tokyo Metropolitan University
	Ryota YOSHIDA	JAXA

Finance Committee

Chairperson of the Committee	Toshihisa MATSUE	MELCO
Co-Chairperson	Atsushi MARUYAMA	MELCO
	Koji TAKAO	IHI
	Masaharu TAKADA	IA
	Takayuki KAWAI	JAXA
	Kousetsu INABA	NEC
	Yuji KOBAYASHI	FIJITSU
	Hidetsugu UKUTA	MHI
	Hiroki NISHIMURA	KHI

Conference Venue and Registration Committee

Chairperson of the Committee	Kojiro SUZUKI	The University of Tokyo
Co-Chairperson	Daisuke AKITA	Tokyo Institute of Technology
	Toshihiro CHUJO	Tokyo Institute of Technology
	Hiroyuki NISHIDA	Tokyo Univ. of Agriculture and Technology
	Satoshi NONAKA	JAXA
	Toshiyuki SUZUKI	JAXA

Public Relations and Outreach Committee

Chairperson of the Committee	Kaori SASAKI	JAXA
Co-Chairperson	Mitsuru WATADO	JAXA
	Kazue TOMINAGA	Space Advisors Association
	Hitoshi YAMAOKA	NAOJ
	Yuta KIKUCHI	JAXA
	Wataru TAKAHAMA	Oita Prefecture
	Koji MATSUKAWA	Beppu City

Exhibition Committee

Chairperson of the Committee	Kaori SASAKI	JAXA
Co-Chairperson	Seiji OTSUKA	JAXA
	Daiki KATO	JAXA
	Wataru TAKAHAMA	Oita Prefecture
	Koji MATSUKAWA	Beppu City

Publications Committee

Chairperson of the Committee	Kazutaka NISHIYAMA	JAXA
Co-Chairperson	Yusuke MARU	JAXA
	Masahiro NOMI	Shizuoka University
	Atsushi MATSUDA	Meijo University
	Kiyoshi KINEFUCHI	Nagoya University
	Katsuhiko YAMADA	Nagoya University
	Naoya OZAKI	JAXA
	Daisuke NAKADA	Muroran Institute of Technology

Venue Relations Committee

	Wataru TAKAHAMA	Oita Prefecture
Chairperson of the Committee	Koji MATSUKAWA	Beppu City
Co-Chairperson	Yoshimichi OCHI	Oita University
Co-Chairperson	Masahiko MUROZONO	NBU
		Oita Industrial Associaion

33rd ISTS Program Subcommittee Members' List

a) Session (Chemical Propulsion and Air-breathing Engines)

Chairperson of the committee	Mikiya ARAKI	Gunma University
Co-Chairperson	Keniichi TAKAHASHI	Nihon University
	Yu DAIMON	JAXA
	Hiroki MATSUNAGA	Fukuoka University
	Kazuki SAKAKI	JAXA
	Ken MATSUOKA	Nagoya University
	Daisuke NAKATA	Muroran Institute of Technology
	Kengo YAMAMOTO	IHI Aerospace
	Justin HARDI	DLR
	Filippo MAGGI	Politecnico di Milano
	Cheng HUANG	University of Michigan

b) Session (Electric and Advanced Propulsion)

Chairperson of the committee	Hiroyuki KOIZUMI	University of Tokyo
Co-Chairperson	Yoshinori NAKAYAMA	National Defense Academy
	Akira KAKAMI	Tokyo Metropolitan University
	Ryudo TSUKISAKI	JAXA
	Masayuki TAKAHASHI	Tohoku University
	Hokuto SEKINE	University of Tokyo
	Gen ITO	IHI
	Hiroyuki NISHIDA	Tokyo Univ. of Agriculture & Technology
	Hiroki WATANABE	Tokyo Metropolitan University
	Tony SCHÖNHERR	ESA/ESTEC
	Guangqing Xia	Dalian University of Technology
	Wonho CHOE	KAIST
	Carsten SCHARLEMANN	Fachhochschule Wiener

c) Session (Materials and Structures)

Chairperson of the committee	Hiroaki TANAKA	National Defense Academy
Co-Chairperson	Atsuhiko SENBA	Meijo University
	Takeshi AKITA	Chiba Institute of Technology
	Tomohiro YOKOZEKI	University of Tokyo
	Masaki KOTANI	JAXA
	Yugo KIMOTO	JAXA
	Yasutaka SATO	JAXA

d) Session (Astrodynamics, Navigation, Guidance and Control)

Chairperson of the committee	Takaya INAMORI	Nagoya University
Co-Chairperson	Satoshi SATO	Osaka University
	Takehiro HIGUCHI	Yokohama National University
	Hirohisa KOJIMA	Tokyo Metropolitan University
	Mai BANDO	Kyushu University
	Takanori IWATA	JAXA

e) Session (Fluid Dynamics and Aero-thermodynamics)

Chairperson of the committee	Keiichi KITAMURA	Yokohama National University
Co-Chairperson	Hiroyuki NISHIDA	Tokyo Univ. of Agriculture & Technology
	Katsuyoshi FUKIBA	Shizuoka University
	Naofumi OONISHI	Tohoku University
	Makoto SATO	Kogakuin University
	Toshiyuki SUZUKI	JAXA
	Hirotaka OOTSU	Ryukoku University
	Atsushi MATSUDA	Meijo University
	Takashi MATSUNO	Tottori University
	Masato TAGUCHI	National Defense Academy

f) Session (Small Satellite)

Chairperson of the committee	Yuji SAKAMOTO	Tohoku University
Co-Chairperson	Tomohiro ISHIKAWA	Tokyo Metropolitan College of Industrial Technology
	Ryoichi SEKITA	Fukuyama University
	Seisuke FUKUDA	JAXA
	Norihide MIYAMURA	Meisei University
	Keiichi OKUYAMA	Kyushu Institute of Technology
	Masanori NISHIO	Aichi University of Technology
	Saburo MATSUNAGA	Tokyo Institute of Technology
	Hiraku SAKAMOTO	Tokyo Institute of Technology

g) Session (Space Transportation)

Chairperson of the committee	Wataru SARAE	JAXA
Co-Chairperson	Takehiro HIMENO	University of Tokyo
	Hiroshi IKAIDA	JAXA
	Koki KITAKAWA	JAXA
	Atsushi MURAKAMI	IHI Aerospace
	Koji KANETAKE	MHI
	Kozuhide MIZOBATA	Muroran Institute of Technology

h) Session (Microgravity Science and Technology)

Chairperson of the committee	Satoshi MATSUMOTO	JAXA
Co-Chairperson	Takehiko ISHIKAWA	JAXA
	Satoshi ADACHI	JAXA
	Masao KIKUCHI	JAXA
	Taishi YANO	Yokohama National University
	Osamu KAWANAMI	Hyogo University
	Masato SAKURAI	JAXA
	Ranga NARAYANAN	University of Florida

i) Session (Thermal Control)

Chairperson of the committee	Hosei NAGANO	Nagoya University
Co-Chairperson	Hiroki NAGAI	Tohoku University
	Hiroyuki OGAWA	JAXA
	Hiroyuki SUGITA	JAXA

j) Session (Satellite Communications, Broadcasting and Navigation)

Chairperson of the committee	Tetsushi IKEGAMI	Meji University
Co-Chairperson	Yoshiyuki FUJINO	Toyo University

k) Session (Science and Technology for Human and Robotic Space Exploration)

Chairperson of the committee	Takahiro IWATA	JAXA
Co-Chairperson	Genya ISHIKAMI	Keio University
	Naru HIRATA	Aizu University
	Hiroki NAGAI	Tohoku University

l) Session (IAA Low-Cost Planetary Missions)

Chairperson of the committee	Hajime YANO	JAXA
Co-Chairperson	Ryu FUNASE	JAXA
	Naoya OZAKI	JAXA
	Shintaro NAKAJIMA	JAXA
	John BAKER	Caltech
	Pierre BOUSQUET	CNES

m) Session (Sounding Rocket and Balloon)

Chairperson of the committee	Kazuhiko YAMADA	JAXA
Co-Chairperson	Yoshitaka SAITO	JAXA
	Shigeki AOKI	Kobe University
	Hideyuki FUKE	JAXA
	Hiroto HABU	JAXA
	Takumi ABE	JAXA
	Jiro KASAHARA	Nagoya University
	Toshihiko NAKANO	National Institute of Technology, Oita College
	Yidong GU	Chinese Academy of Sciences
	Kjell BØEN	Andøya Space Center

n) Session (Earth Observation)

Chairperson of the committee	Hiroshi MURAKAMI	JAXA
Co-Chairperson	Rigen SHIMADA	JAXA
	Takuji KUBOTA	JAXA
	Kei SHIOMI	JAXA
	Tadashi IMAI	JAXA
	Masato OOKI	JAXA
	Yoshinobu SASAKI	JAXA
	Keiji IMAOKA	Yamaguchi University
	Robert FROUIN	Scripps Institution of Oceanography

p) Session (Space Life Science)

Chairperson of the committee	Takeshi NIKAWA	Tokushima University
Co-Chairperson	Katsuya HIRASAKA	Nagasaki University
	TOMITA-YOKOTANI-KAORI	Tsukuba University
	Atsushi HIGASHITANI	Tohoku University
	Akira TAKAHASHI	Tokushima University
	Takeshi KOBAYASHI	Nagoya University
	Naoto SHIBA	Kurume University
	Satoru TAKAHASHI	Tsukuba University
	Info CHOI	Yonsei University
	Stephane BLANC	CNRS, FRANCE

q) Session (Space Power Systems)

Chairperson of the committee	Koji TANAKA	JAXA
Co-Chairperson	Paul JAFFE	U.S Naval Research Laboratory
	Hiroyuki TOYOTA	JAXA
	Makoto SHINOHARA	Kyoto University
	Yoshiyuki FUJINO	Toyo University
	Hitoshi NAITO	JAXA
	Mitsuru IMAIZUMI	JAXA
	Xinbin HOU	China Academy of Space Technology
	Joonmin CHOI	Korean Aerospace Research Insititute
	SangHwa YI	Korean Aerospace Research Insititute

r) Session (Space Environment and Debris)

Chairperson of the committee	Toshifumi YANAGISAWA	JAXA
Co-Chairperson	Kiyokazu KOGA	JAXA
	Yoshizumi MIYOSHI	Nagoya University
	Hiroaki MIYAKE	Tokyo City University
	Yukihito KITAZAWA	JAXA
	Kazuhiro TOYODA	Kyushu Institute of Technology
	Nitta KUMI	JAXA
	Toshiya HANADA	Kyushu University

s) Session (Student Session)

Chairperson of the committee	Junichiro AOYAGI	Yamanashi University
Co-Chairperson	Hideto MASHIDORI	Tokyo Metropolitan College of Industrial Technology
	Hironori SAHARA	Tokyo Metropolitan University
	Tomohiro YOKOSEKI	University of Tokyo
	Yutaka WADA	Chiba Institute of Technology
	Yuichi IKEDA	Shonan Institute of Technology
	Kyoichi NAKASHINO	Tokai University
	Norihide MIYAMURA	Meisei University
	Yasuhiro YOSHIMURA	Kyushu University
	Hiraku SAKAMOTO	Tokyo Institute of Technology

t) Session (Systems Engineering and Information Technology)

Chairperson of the committee	Makoto IOKI	Keio University
Co-Chairperson	Hiraku SAKAMOTO	Tokyo Institute of Technology
	Yasushi SATO	Niigata University
	Yohsuke NAMBU	Osaka Prefecture University
	Toshihiro OBATA	University of Tokyo
	Takashi OHTANI	JAXA

u) Session (Space Education and Outreach for the Benefit of All People)

Chairperson of the committee	Yukata WADA	Chiba Institute of Technology
Co-Chairperson	Kaori SASAKI	JAXA
	Hiroshi HIRAYAMA	Akita University
	Hiroaki AKIYAMA	Wakayama University
	Rei KAWASHIMA	UNISEC
	Toshiaki TAKEMAE	JAXA
	Akemi KUROTANI	JAXA
	Toshiyuki KATSUMI	Nagaoka Univ. of Technology
	Makoto YOSHIKAWA	JAXA
	Misuzu OHNUKI	Space Frontier Foundation
	Yoko IWATA	Tokyo Univ. of Agriculture & Technology

v) Session (Space Law, Policy and History)

Chairperson of the committee	Hirotaka WATANABE	Osaka University
Co-Chairperson	Yasuaki HASHIMOTO	The National Institute for Defense Studies
	Souichiro KOZUKA	Gakushuin University
	Masahiko SATO	JAXA

w) Session (Safety and Mission Assurance)

Chairperson of the committee	Koichi SUZUKI	JAXA
Co-Chairperson	Ryoji KOBAYASHI	JAXA
	Hiroyuki SHINDO	JAXA
	Shuji ARAKI	JAXA
	Koji OGA	JAMSS

Hayabusa2 return to Earth

Future lunar base *(image)*

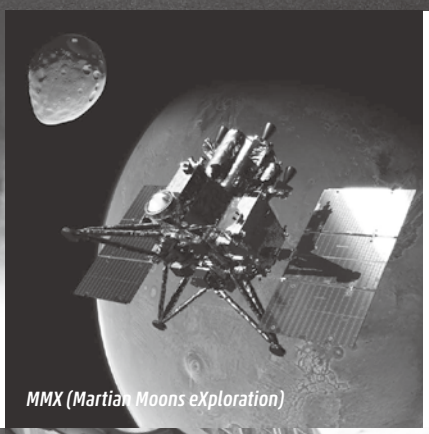
Reaching the Space Frontiers

JAPANESE
https://www.jaxa.jp

ENGLISH
https://global.jaxa.jp

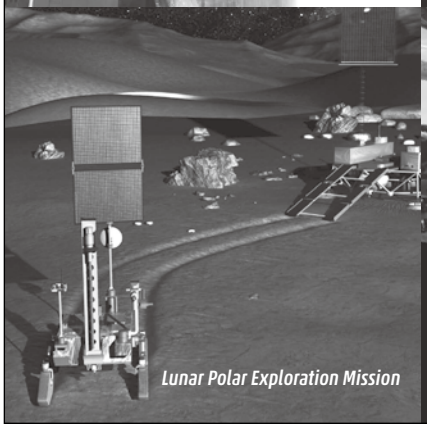
Hayabusa2 return to Earth

Epsilon-5



MMX (Martian Moons eXploration)

JAXA



Lunar Polar Exploration Mission

Astronaut Hoshide conducting EVA ©JAXA/NASA

技術（ぎじゅつ）と叡智（えいち）。

168年、受け継がれてきたもの。
磨き続けてきたもの。
私たちの中心にあるもの。

IHI（アイ エイチ アイ）

問題解決型の
総合重工業グループ

株式会社IHI

Maintaining our value to society by adapting to changing times and embracing the challenges facing humankind today, tomorrow and well into the future — on land and at sea, in the sky and in space, we move the world forward.

MITSUBISHI HEAVY INDUSTRIES

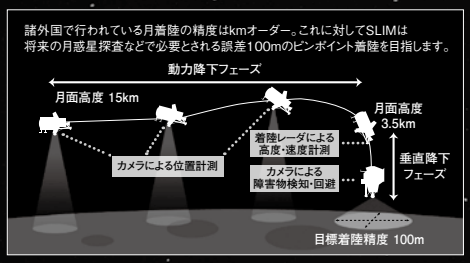
Mitsubishi Heavy Industries., Ltd.

MOVE THE WORLD FORW➢RD MITSUBISHI HEAVY INDUSTRIES GROUP

MITSUBISHI ELECTRIC
Changes for the Better

ニッポン、いざ月面着陸へ。
誤差100mの高精度着陸技術で、
月惑星探査の未来を拓く。

全高約2mほどの小型月着陸実証機SLIM（Smart Lander for Investigating Moon）。
重力のある天体において「降りたいところに降りる」という課題に応えるため、
世界初となる誤差100mの高精度着陸技術に挑む、日本のプロジェクトです。
三菱電機は、この小型探査機のシステム設計から製造までを担当。
無人機でありながら、カメラが捉えたクレーターを地図と比較し、正確に目標地点に接近。
岩石等の障害物を検知し、自動回避しながら安全に着陸します。
また、探査機を軽量化することで月惑星探査の高頻度化にも貢献。
小さな探査機が、太陽系の解明へ大きく躍進させます。



※画像は合成イメージです。

www.MitsubishiElectric.co.jp/society/space/

三菱電機株式会社

\Orchestrating a brighter world

NEC


Oita 大分県
Beppu
別府市