

## Final Program

### 16th International Space Conference of Pacific-basin Societies (ISCOPS)

November 19-22, 2024

Tokachi Plaza

Nishi 4, Minami 13-1, Obihiro <https://okamotopbc.jp/tokachi-plaza/>

#### CONFERENCE ORGANIZATION

##### General Co-Chairs

AAS Mr. Ronald J. Birk  
 CSA Mr. Wang Yiran  
 JRS Prof. Yasuhiro Morita

##### Technical Co-Chairs

AAS Prof. Arun Misra  
 CSA Mr. Chen Jie  
 JRS Prof. Satoshi Nonaka

Note: The duration of each presentation in the technical session is *20 minutes including discussion*.

Tuesday, 19 November 2024	
15:00 - 18:00	<b>Welcome Reception/ Registration</b> Tokachi Plaza, Atrium (entrance hall)
Wednesday, 20 November 2024	
08:45 – 17:00	<b>Registration</b> (Tokachi Plaza, Rainbowhall entrance)
09:30 – 10:15	<b>Opening Ceremony</b> Tokachi Plaza, Rainbowhall (2F) <ul style="list-style-type: none"> <li><b>Welcome Remarks by Technical Co-Chair</b> Prof. Satoshi Nonaka (Technical Co-Chair, JRS)</li> <li><b>Welcome Remarks by Honorary Co-Chair</b> Prof. Kuninori Uesugi (Former President, Honorary member, JRS)</li> <li><b>Introductory Remarks by General Co-Chairs</b> Prof. Yasuhiro Morita (President, JRS) Mr. Ronald J. Birk (President, AAS) Mr. Wang Yiran (Vice President, CSA)</li> <li><b>Spark M. Matsunaga Memorial Award Ceremony</b> Prof. Hiroaki Kobayashi (JRS)</li> <li><b>Program Overview</b> Prof. Satoshi Nonaka (Technical Co-Chair, JRS)</li> <li><b>Introduction to the Technical Visit and Banquet</b> Prof. Yusuke Maru (JRS)</li> </ul>

10:15 – 10:30	<b>Coffee Break</b>		
10:30 – 12:00	<b>Plenary Lectures</b> <b>Mr. Lv Shaoyang (Beijing Institute of Technology)</b> Reachable Domain of Multiple Gravity-Assist Transfer Trajectory <b>Prof. Arun Misra (Professor, McGill University, Technical Co-chair, AAS)</b> Title: TBD <b>Dr. Makoto Yoshida (Former Head of Kakuda Space Center JAXA, Director of JRS)</b> Title: TBD		
12:00 – 12:30	<b>Special Lecture</b> <b>Mr. Takahiro Inagawa (Chief Executive Officer, Interstellar Technologies Inc.)</b> Exploring the Space Industry and Private Sector Rocket Development		
12:30 – 14:00	<b>Lunch Break</b>		
	<b>Room 1 (401)</b>	<b>Room 2 (304)</b>	<b>Room3 (306)</b>
14:00 – 15:20	<b>Session B.1</b> <b>Chair: W. Sicheng</b>  <b>Tetsuya Kusumoto (JAXA)</b> Polynomial Approximation-Based Guidance and Navigation for Flyby of CC21  <b>Seisuke Fukuda (JAXA)</b> Operation Results of Smart Lander for Investigating Moon (SLIM)  <b>Kentaro Yokota (JAXA)</b> Attitude Control and Dynamics Analysis for the SLIM Cruise Phase  <b>Nobutaka Bando (JAXA)</b> Guidance Navigation Control System for Deep Space Rendezvous Docking and Development Plan	<b>Session B.5</b> <b>Chair: H. Kobayashi</b>  <b>Ayuto Suzuki (Waseda University)</b> Visualization and Modeling of Internal Flow a Ramjet Engine for High-Mach Integrated Control Experiment (HIMICO)  <b>Riho Hiramoto (Hokkaido University of Science)</b> Consideration on Balloon Kite and its Chain  <b>Naoto Adachi (Uemtsu Electric)</b> Uematsu Electric's R&D Support: Establishment and Prospects of the Akabira Propellant Laboratory	<b>Session C (Master)</b> <b>Chair: K. Kinefuchi</b>  <b>Takunobu Takahashi (University of Tokyo)</b> Study of Full-Time Abort Feasibility for Reusable Space Vehicles  <b>Kaho Nakagawa (University of Tokyo)</b> Simulated Flight Experiment of Single Actuator Spinning Lander with Thrust Vector Control  <b>Reo Iida (Nagoya University)</b> Study of Aerodynamic Characteristics of an Atmospheric Entry System Using a Deployable Flexible Aeroshell with Double-Sided Flares  <b>Haruyuki Kakimoto (YOKOHAMA National University)</b> A Rear-Slanted Protuberance for Side Force Reduction on Slender Launch Vehicle
15:20 – 15:40	<b>Coffee Break</b>		

	Room 1 (401)	Room 2 (304)	Room3 (306)
15:40 – 17:00	<p><b>Session B.1</b> <b>Chair: W. Sicheng</b></p> <p><b>Cao Zhi</b> (SACTI) Multi-axis gyro signal synchronization technology based on inertial measurement unit</p> <p><b>Li Qing</b> (SACTI) Robust IMM Filter for Space Non-cooperative Maneuvering Targets Tracking</p> <p><b>Liu Tianci</b> (BIT) Tightly-Coupled Skymark/INS Integrated Navigation Using Very Short-Arc Observations of Near-Earth Satellites</p> <p><b>Liu Yuanpeng</b> (ASES) Research on Overall Deviation Design for Reusable Launch Vehicles Based on Spatial Trajectory Alignment</p>	<p><b>Session B.5</b> <b>Chair: S. Nonaka</b></p> <p><b>Yusuke Maru</b> (JAXA) Study of Three-dimensional Air Inlet Ingesting Boundary Layer for Vertical Take-off and Landing Reusable Rocket</p> <p><b>Taisei Shimoda</b> (Waseda University) Development of All-Metal Capacitive Void Fraction Sensor for Cryogenic Two-Phase Flow</p> <p><b>Akihito Ogawa</b> (IHI Aerospace Co., Ltd) The Development Results of the Ground Test Model of the Power Generation and Transmission Panel Aimed at Realizing Space Solar Power System</p> <p><b>Hiroaki Kobayashi</b> (JAXA) Reconstruction and Expansion Plan for the Noshiro Rocket Testing Center</p>	<p><b>Session C (Master)</b> <b>Chair: M. Yoshida</b></p> <p><b>Kaito Kimura</b> (Muroran Institute of Technology) Reduced Order Modeling for Model Based Development of a Full Flow Cycle Rocket Engine</p> <p><b>Jason Nathanael</b> (Muroran Institute of Technology) Mission Possibilities of Rocket Sled Experiments Utilizing 300-m-long Test Track</p> <p><b>Allen Chan</b> (Nagoya University) Operational Characteristics of a Cylindrical Rotating Detonation Engine with Inert Gaseous Film Cooling</p> <p><b>Tatsuki Ohyama</b> (Nagoya University) Experimental Study on a Liquid-Ethanol Rotating Detonation Engine with Single Pintle Injector</p>

Thursday, 21 November 2024			
	Room 1 (401)	Room 2 (304)	Room3 (306)
10:00 – 12:00	<p><b>Session B.1/B.2</b> <b>Chair: S. Fukuda</b></p> <p><b>Wang Sicheng</b> (BIT) Analysis of the Feasibility Domain Envelope for Multiple Gravity-Assist</p> <p><b>Chen Cheng</b> (BIT) Analysis of Multi-Scale Orbit Uncertainty Propagation for Solar Boundary Exploration Based on Gaussian Mixture Model</p>	<p><b>Session B.5</b> <b>Chair: Y. Maru</b></p> <p><b>Yuma Miki</b> (Nagoya University) Mass Capture Ratio Evaluation of Supersonic Busemann Intake for ATRIUM Combined Cycle Engine</p> <p><b>Satoshi Nonaka</b> (JAXA) Recent Study on Reusable Vehicle Systems</p> <p><b>Ryoma Yamashiro</b> (JAXA)</p>	<p><b>Session C (Ph.D)</b> <b>Chair: T. Himeno</b></p> <p><b>Jennifer Ng</b> (University of Tokyo) Designing a Liquid Mirror Telescope Using Magnetic Fields to Deform Ferrofluid into a Parabola</p> <p><b>Yownin Albert M. Leung</b> (Hokkaido University) Development of a Combustion Visualization Wind Tunnel for Hybrid Rocket Ignition Testing</p>

	<p><b>Zhao Shengyun</b> (Beihang University) Automated Annotation and Optimization of Multitask Datasets for Spacecraft</p> <p><b>Xue Xiaopeng</b> (Central South University) Numerical study on aerodynamic performances of flexible parachute system with different porosities for Mars exploration missions</p> <p><b>Takayuki Yamamoto</b> (JAXA) Low-thrust Trajectory design of DESTINY+</p>	<p>Research and development of a 4-ton class rocket engine for rocket startups</p> <p><b>Song Chuanlong</b> (Shanghai Spaceflight Institute of TT&amp;C and Telecommunication) Hierarchical scheduling optimization of interplanetary tasks based on deep reinforcement learning</p> <p><b>Zhou Hengjie</b> (Shanghai Institute of Spaceflight Control Technology) Design of FPGA-based spatial switch acceleration and deceleration algorithm</p>	<p><b>Ryusei Komatsu</b> (SOKENDAI) Lunar Navigation Constellation Design: Characterizing Families of Periodic Orbits in Earth-Moon System</p> <p><b>Takayuki Shihara</b> (University of Tokyo) Method to Design Escape Trajectory from Secondary Body in the Elliptic Restricted Three-Body Problem</p> <p><b>Alexander Scott Hillstrom</b> (Nagoya University) Optimization and testing of an additively manufactured multi-wall electrothermal thruster heating element</p> <p><b>Yuki Miyara</b> (University of Tokyo) Numerical Analysis on Pressure Loss and Heat Transfer Characteristics of Flow Boiling in Earth Gravity and Microgravity with Wall Boiling Model</p>
12:00 – 14:00	<b>Lunch Break</b>		
	<b>Room 1 (401)</b>	<b>Room 2 (304)</b>	<b>Room3 (306)</b>
14:00 – 15:20	<p><b>Session B.2</b> <b>Chair: H. Nishida</b></p> <p><b>Zhang Feng</b> (CALT) Online Trajectory Planning Scheme Design for a Class of Long-Range Aerospace Transportation Vehicles</p> <p><b>Ji Xu</b> (SACTI) Adaptive Two-Stage Extended Kalman Filter Based on Sequential Processing for SINS/BDS Tightly Integrated System</p> <p><b>Chen Zenghao</b> (SACTI) Lightweight bionic three-jaw</p>	<p><b>Session B.4</b> <b>Chair: R. Yamashiro</b></p> <p><b>Shingo Matsuyama</b> (JAXA) Conceptual Design Study on Hypersonic Point-to-Point Transporter with Rotating Detonation Engine</p> <p><b>Shusuke Hori</b> (JAXA) Test Flight Results of LE-9 Engine</p> <p><b>Li Tianwen</b> (Beihang University) Experimental Investigation</p>	<p><b>Session C (Ph.D)</b> <b>Chair: T. Himeno</b></p> <p><b>Shin Sakai</b> (University of Tokyo) Numerical estimation of slip ratio for cryogenic gas-liquid two-phase flow in venturi tube</p> <p><b>Ayano Watanabe</b> (Tokyo University of Agriculture and Technology) Experimental investigation of transient flow during burst-in-burst control of high-angle-of-attack separation flow over an</p>

	<p>dual-motor robotics end effector</p> <p><b>Chen Zilong</b> (Beihang University) Deep probabilistic Gauss-Bingham network with uncertainty quantification for noncooperative spacecraft pose estimation</p>	<p>of a Liquid Oxygen-Kerosene Pintle Injector</p> <p><b>Guo MengFei</b> (Xi'an University of Technology) ZrO<sub>2</sub>-reinforced EPDM-based insulation material suitable for solid rocket motor combustion chambers</p>	<p>airfoil</p> <p><b>Su Wenjie</b> (Beihang University) Stochastic Fuel-optimal powered descent guidance with free-flight-time and non-Gaussian chance constraints</p> <p><b>Zhu Hangbiao</b> (Beihang University) Invariant Extended Kalman Filter on SE(3) for Asteroid-Hovering Spacecraft Navigation</p>
15:20 – 15:40	<b>Coffee Break</b>		
	<b>Room 1 (401)</b>	<b>Room 2 (304)</b>	<b>Room 3 (306)</b>
15:40 – 16:40	<p><b>Session B.3/B.4/B.7</b> <b>Chair: H. Nishida</b></p> <p><b>Daizo Sugimori</b> (JAXA) Japan's H3 Launch Vehicle Development Status</p> <p><b>Ren He</b> (Beihang University) Distributed Trajectory Optimization for Spacecraft Formation Reconfiguration Using Multi Agents Reinforcement Learning</p> <p><b>Qiao Lisha</b> (China Academy of Launch Vehicle Technology) The Suggestions on International Law Norms of Cislunar Space</p>	<p><b>Session B.4</b> <b>Chair: T. Yamamoto</b></p> <p><b>Kang Shipeng</b> (Shanghai Key Laboratory of Spacecraft Mechanism) Fast Response Characteristics Research of Large Thrust Long Stroke Cylinder</p> <p><b>Wang Tong</b> (Beijing institute of remote sensing equipment) Thermal and mechanical coupling simulation of Ir-Re-C combustor nozzle wall</p>	<p>(Discussion on International Students Conference and Competition Results)</p>
18:00 – 19:00	<b>Cocktail Reception</b> IN THE SUITE		
19:00 – 21:00	<b>Awards Banquet</b> IN THE SUITE Students Awards Ceremony Remarks on the Next ISCOPS		

Friday, 22 November 2024		
	Room 1 (401)	Room 2 (304)
10:00 – 10:40	<p><b>Session B.3</b> Chair: <b>S. Nonaka</b></p> <p><b>Thais Cardoso Franco</b> (Aeronautics Institute of Technology) Formation Flying Design Applied for an Aurora Borealis Monitoring Mission</p> <p><b>Ye Lijun</b> (Shanghai Key Laboratory of Aerospace Intelligent Control Technology) Design of Self-Stable Geosynchronous Orbit Constellation</p>	<p><b>Session B.7</b> Chair: <b>H. Nishida</b></p> <p><b>Gao Lan</b> (Beihang University) On the Inapplicability of International Humanitarian Law in Outer Space: Discussing the Necessity for Expanding Categories of Unintentional Damage</p> <p><b>Li Jinxuan</b> (Wuhan University) Activating the principle of “take into particular account the needs of developing countries” in the distribution of frequency orbit resources</p>
10:40 – 12:00	<b>Lunch Break</b>	
12:00 – 18:00	<p><b>Technical Tour to Taiki Town (Hokkaido Space Port, etc)</b> The tour participants please meet at 12:00 in front of the venue. Bus transportation will be provided and will leave the venue promptly at 12:15. The return transportation will be back to the venue.</p>	

AAS: American Astronautical Society

ASES: Aerospace System Engineering Shanghai

BIT: Beijing Institute of Technology

CALT: China Academy of Launch Vehicle Technology

CSA: Chinese Society of Astronautics

JAXA: Japan Aerospace Exploration Agency

JRS: Japanese Rocket Society

SACTI: Shanghai Aerospace Control Technology Institute

## Program Overview of 16th ISCOPS

Tuesday, 19 November 2024			
15:00 – 18:00	<b>Welcome Reception/ Registration</b>		
Wednesday, 20 November 2024			
AM	<b>OPENING CEREMONY</b> <b>Plenary Lectures</b> <b>Special Lecture</b>		
PM	<b>Room 1 (401)</b> <b>Session B.1</b> Astrodynamics, Guidance and Control	<b>Room 2 (304)</b> <b>Session B.5</b> Space Systems, Transportation, Payloads and Infrastructure	<b>Room 3 (306)</b> <b>Session C (Master)</b> International Students Conference and Competition
Thursday, 21 November 2024			
AM	<b>Room 1 (401)</b> <b>Session B.1/B.2</b> Astrodynamics, Guidance and Control Space Exploration and Space Robotics	<b>Room 2 (304)</b> <b>Session B.5</b> Space Systems, Transportation, Payloads and Infrastructure	<b>Room 3 (306)</b> <b>Session C (Ph.D)</b> International Students Conference and Competition
PM	<b>Room 1 (401)</b> <b>Session B.3/B.4/B.7</b> Small Satellites, Formation Flying and Constellations Space Materials, Structures, Power and Propulsion Space Laws and Regulations	<b>Room 2 (304)</b> <b>Session B.4</b> Space Materials, Structures, Power and Propulsion	<b>Room 3 (306)</b> <b>Session C (Ph.D)</b> International Students Conference and Competition
19:00 – 20:00	<b>Awards Banquet</b>		
Friday, 22 November 2024			
AM	<b>Room 1 (401)</b> <b>Session B.3</b> Small Satellites, Formation Flying and Constellations	<b>Room 2 (304)</b> <b>Session B.7</b> Space Laws and Regulations	
PM	<b>Technical Tour to Taiki Town</b>		