

International Symposium on Green Transformation Initiative and Innovative Zero-Carbon Energy Systems (GXI-ZES)

Program (2025.1.6 ver)

14th January – 16th January, 2025
Institute of Science Tokyo, Japan

Organized by :

- Organizing Committee of GXI-ZES
- Laboratory for Zero-Carbon Energy (ZC), Institute of Integrated Research (IIR), Institute of Science Tokyo
- Green Transformation Initiative at Science Tokyo (Science Tokyo GXI)



Welcome to GXI-ZES

On behalf of the symposium, I thank deeply all presenters and participants on the International Symposium on Green Transformation Initiative and Innovative Zero-Carbon Energy Systems, GXI-ZES, Tokyo, on January 14th -16th, 2025.

Green Transformation Initiative, that is, Science Tokyo GXI in the Institute of Science Tokyo* was established in 2022 as a Mission Realization Acceleration Funding Project of the Ministry of Education, Culture, Sports, Science and Technology.



GXI aims to realize Green Transformation (GX) technologies to achieve CN through open innovation in industry, government, academia and public sector collaboration. This symposium GXI-ZES was organized by GXI, Institute of Integrated Research, and Science Tokyo for enhancement of the innovations.

GXI-ZES aims at discussing the latest research activities relevant to the development of GX technologies and innovative zero-carbon energy systems, which shall be the technologies for a carbon-neutral society, including zero-carbon energy, energy storage, energy carrier, climate change mitigation, carbon neutral and innovative nuclear energy and application technologies within a broad perspective. The goal is to visualize and share a new stage of the GX technologies and zero-carbon energy system technologies.

The symposium programs the special collaboration sessions organized with Massachusetts Institute of Technology (MIT), Electric Power Research Institute (EPRI), and German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt, DLR) for the GX key subjects of the decarbonization, the energy carrier and the energy storage, respectively. GXI has been submitted a position paper of “GXI VISION 2050” in this September, then, GXI VISION 2050 session is set in the last day.

GX technology cannot be advanced through the efforts of individuals or companies alone. I believe that it can be solved by many people working together and demonstrating their individual abilities. I hope that this conference will be the start of that solution. I greatly appreciate all of you for your great contribution to the GXI-ZES. I hope that all participants will deepen their exchanges in order to achieve CN.

加藤之貴

Yukitaka Kato,

General Chair of GXI-ZES

*Institute of Science Tokyo, Science Tokyo, was born by the integration between Tokyo Institute of Technology and Tokyo Medical and Dental University in 2024.

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- Organizing Committee of GXI-ZES
- Laboratory for Zero-Carbon Energy (ZC), Institute of Integrated Research (IIR), Science Tokyo
- Green Transformation Initiative at Science Tokyo (Science Tokyo GXI)

Supported by:

- MIT Energy Initiative (MITEI)
- MIT Center for Advanced Nuclear Energy Systems (MIT-CANES)
- Electric Power Research Institute, Inc. (EPRI)
- Deutsches Zentrum für Luft- und Raumfahrt (DLR)
- Japan Atomic Energy Commission (JAEC)
- Japan Atomic Energy Agency (JAEA)
- Atomic Energy Society of Japan (AESJ)
- The Chemical Society of Japan (CSJ)
- The Electrochemical Society of Japan (ECSJ)
- The Heat Transfer Society of Japan (HTSJ)
- Institute of Nuclear Materials Management Japan Chapter (INMMJ)
- The Iron and Steel Institute of Japan (ISIJ)
- Japanese Society of Radiation Chemistry (JSRC)
- Japan Fine Ceramics Association (JFCA)
- The Japan Society for Analytical Chemistry (JSAC)
- Japan Society of Energy and Resources (JSER)
- The Japan Society of Plasma Science and Nuclear Fusion (JSPF)
- The Society of Chemical Engineers, Japan (SCEJ)
- Science Tokyo Academy for Convergence of Materials and Informatics (TAC-MI)
- Science Tokyo InfoSyEnergy Research and Education Consortium / School of Academy of Energy and Informatics (ISE)

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GXI-ZES Symposium Schedule:

Day 1

Day1 January 14, 2025 Tue.	Room1:Hall	Room2	Room3
	Digital multi-purpose hall (No eating or drinking) W9-bldg.	Collaboration room W9-bldg.	W8-10F Conference room W8-bldg.
	8:00		
	Registration 8:15-9:00		
	9:00		
	Opening Ceremony General Chair Prof. Yukitaka Kato President & CEO Prof. Naoto Ohtake METI, Mr. Takatsugu Ryuzaki MEXT, Mr. Koji Yanagisawa		
	Photo Session 9:30-10:00		
	10:00		
	MIT Session on Decarbonization Plenary Lecture MIT-1 : Prof. William H. Green Plenary Lecture MIT-2 : Prof. Jacopo Buongiorno		
	11:00		
10min Break			
Plenary Lecture MIT-3: Dr. Masami Takenaka, Asahi Kasei Corporation Plenary Lecture MIT-4: Dr. Koichi Izumiya, Kanadevia Corporation			
12:00			
Panel talk 20min			
	12:10-13:30 Lunch (80 min)@Tsubame Terrace		
13:00			
14:00			
13:30-14:30 Session 1(1S1) Decarbonization technique-1 Abstract Abstract No.17(1S1-1) Abstract Abstract No.49(1S1-2) Abstract Abstract No.102(1S1-3)	13:30-14:30 Session 4(1S4) Innovative reactors and fuels-1 Abstract Abstract No.25(1S4-1) Abstract No.39(1S4-2) Abstract No.103(1S4-3)	13:30-14:30 Session 7(1S7) Decontamination of Radioactive Wastes Abstract Abstract No.27(1S7-1) Abstract No.30(1S7-2) Abstract No.10(1S7-3)	
10min Break			
15:00			
14:40-15:40 Session 2(1S2) Decarbonization technique-2 Abstract No.24(1S2-1) Abstract No.47(1S2-2) Abstract No.100(1S2-3)	14:40-16:00 Session 5(1S5) Innovative reactors and fuels-2 Abstract No.15(1S5-1) Abstract No.46(1S5-2) Abstract No.34(1S5-3) Abstract No.94(1S5-4)	14:40-15:40 Session 8(1S8) Radiochemistry and Nuclear Medicine-1 Abstract Abstract No.92(1S8-1) Abstract No.6(1S8-2) Abstract No.95(1S8-3)	
10min Break			
16:00			
15:50-17:30 Session 3(1S3) Batteries and Energy carriers Abstract Abstract No.56(1S3-1) Abstract No.38(1S3-2) Abstract No.42(1S3-3) Abstract No.29(1S3-4) Abstract No.61(1S3-5)	10min Break 16:10-17:30 Session 6(1S6) Novel Radionuclide Separation Abstract No.85(1S6-1) Abstract No.89(1S6-2) Abstract No.93(1S6-3) Abstract No.91(1S6-4)	15:50-16:50 Session 9 (1S9) Radiochemistry and Nuclear Medicine-2 Abstract No.33(1S9-1) Abstract No.81(1S9-2) Abstract No.78(1S9-3) Abstract No.64(1S9-4)	
17:00			
Day 1 End 17:30			

Day 2

		Room1:Hall	Room2	Room3
		Digital multi-purpose hall (No eating or drinking) W9-bldg.	Collaboration room W9-bldg.	W8-10F Conference room W8-bldg.
Day 2 January 15, 2025 Wed.	8:00			
		Registration 8:30-9:00	8:30-9:00	
	9:00	EPRI Session on Energy Carrier Plenary Lecture EPRI-1: Jeffery Preece Plenary Lecture EPRI-2: Neil Kern		
	10:00	10min Break		
		Plenary Lecture EPRI-3: Prof. Hiroshi Asano, Central Research Institute of Electric Power Industry Plenary Lecture EPRI-4: Prof. Takeo Yamaguchi, Science Tokyo		
	11:00	Panel Talk 20 min		
		10min Break		
	12:00	Poster short presentation (90 seconds each) 11:20-13:00		
	13:00		13:00-14:00 Poster preparation	
			Lunch (60min) @Tsubame Terrace	
		13:00-14:00 Poster preparation		
14:00		Poster session 1 (odd) (60min) 14:00-15:00		
15:00		Poster session 2 (even) (60min) 15:00-16:00		
16:00	Day 2 End 16:00			
17:00				
Reception Party start 18:00@ the Prince Park Tower Tokyo				

Day 3

Day 3 January 16, 2025 Thur.	Room1:Hall	Room2	Room3
	Digital multi-purpose hall (No eating or drinking) W9-bldg.	Collaboration room W9-bldg.	W8-10F Conference room W8-bldg.
	8:00 Registration 8:15-9:00		
	9:00 DLR Session on Energy Storage Plenary Lecture DLR-1:Dr. Thomas Bauer Plenary Lecture DLR-2:Dr. Inga Bürger		
	10:00 10min Break		
	Plenary Lecture DLR-3: Prof. Takahiro Nomura, Hokkaido University Plenary Lecture DLR-4: Prof. Hajime Arai, Science Tokyo		
	11:00 Panel Talk 20 min		
	20 min break		
	11 : 30-12 : 30 Session 10(3S10) Green inorganic materials Abstract No.53(3S10-1) Abstract No.54(3S10-2) Abstract No.26(3S10-3)	11 : 30-12 : 30 Session 12(3S12) Nuclear Reactions and Applications-1 Abstract No.70(3S12-1) Abstract No.28(3S12-2) Abstract No.74(3S12-3)	11:30-12:30 Session 14(3S14) Energy Policy, Economics, Material Recycling-1 Abstract No.40(3S14-1) Abstract No.20(3S14-2) Abstract No.99(3S14-3)
	13:00 Lunch (60min) @Tsubame Terrace		
13 : 30-14 : 30 Session 11(3S11) Thermal Storage and Use Abstract No.44(3S11-1) Abstract No.48(3S11-2) Abstract No.71(3S11-3)	13 : 30-14 : 10 Session 13(3S13) Nuclear Reactions and Applications-2 Abstract No.50(3S13-1) Abstract No.73(3S13-2)	13 : 30-14 : 30 Session 15(3S15) Energy Policy, Economics, Material Recycling-2 Abstract No.65(3S15-1) Abstract No.68(3S15-2) Abstract No.12(3S15-3)	
14:00 10 min Break			
14:40-16:00 GX VISION 2050 Session Prof. Yukitaka Kato, Science Tokyo Dr. Keigo Akimoto, RITE Prof. Takao Nakagaki, Waseda University Prof. Kenji Takeshita, Science Tokyo			
15:00			
16:00-16:30 Report of GXI-ZES Closing Ceremony, Student Award			
16:00			
Day 3 End 16:30			
17:00			

Program

Day 1

8:15- **Registration**

Room 1: Multi-Purpose Digital Hall (West Bldg. 9)

9:00-9:30 **Opening Ceremony**

Chair: Prof. Hiroshi Sagara

Prof. Yuktaka Kato, General Chair of GXI-ZES, Science Tokyo

Prof. Naoto Ohtake, President and CEO. of Science Tokyo

**Mr. Takatsugu Ryuzaki, Director-General for Green Transformation Acceleration,
Director-General, GX Policy Group, Minister of Economy, Trade and Industry**

**Mr. Koji Yanagisawa, Director, University Research Facilitation Division, Research
Promotion Bureau, Ministry of Education, Culture, Sports Science & Technology**

9:30-10:00 **Photo Session**

10:00-11:00 **MIT Session on Decarbonization**

Chair: Prof. Yoichi Murakami

MIT-1: Energy Transition Challenges for the Engineering Community

Prof. William H. Green, Hoyt C. Hottel Professor of Chemical Engineering, Director of MIT
Energy Initiative, Massachusetts Institute of Technology

MIT-2: Nuclear Energy: Have We Entered a New Era?

Prof. Jacopo Buongiorno, Dept. of Nuclear Science and Engineering, Center for Advanced
Nuclear Energy Systems (CANES), Massachusetts Institute of Technology

11:00-11:10 Break

11:10-12:10 **MIT Session on Decarbonization**

Chair: Prof. Yoichi Murakami

**MIT-3: Decarbonization with Green Hydrogen Production, Bio Process, and CO₂
Capture/Utilization Technologies**

Dr. Masami Takenaka, Green Solution Project, Asahi Kasei Corporation

**MIT-4: Development of Power to Gas Technologies with Methanation and Water
Electrolysis for Implementation of Carbon-Neutral Society**

Dr. Koichi Izumiya, Decarbonization Systems Business Unit, Carbon Neutral Solution
Business Headquarters, Kanadevia Corporation

With Panel Talk

12:10-13:30 Lunch Break @Tsubame Terrace

1S1	Decarbonization technique-1
Chair:	Prof. Tohru S. Suzuki
13:30-13:50	1S1-1 Molecular Design with Generative AI for CO₂ Capture Adroit Fajar, Guillaume Lambard
13:50-14:10	1S1-2 Molten lithium-sodium orthoborate: a high capacity ionic oxide for carbon capture David Unnervik, Takuya Harada
14:10-14:30	1S1-3 The Challenge of Japanese Steel Industry to achieve Carbon Neutrality Hideki Murakami
14:30-14:40	Break
1S2	Decarbonization technique-2
Chair:	Prof. Adroit Fajar
14:40-15:00	1S2-1 Mechanochemistry side by side with the environment. Green and organocatalytic alternative for the synthesis of β-sulfenylated compounds Kamil Hanek, Patrycja Żak, Dawid Frąckowiak
15:00-15:20	1S2-2 Development of Chemical Looping Combustion Poly-Generation Technology Tomonao SAITO, Shi-Ying LIN, Junichiro OTOMO
15:20-15:40	1S2-3 Catalytic biomass transformation for the production of value-added products Sanjay Kumar Singh
15:40-15:50	Break
1S3	Batteries and Energy carriers
Chair:	Prof. Shintaro Yasui
15:50-16:10	1S3-1 High ion conductivity in textured lanthanum silicate oxyapatite fabricated by slip casting in a strong magnetic field Tohru S. Suzuki, Kiyoshi Kobayashi, Tetsuo Uchikoshi
16:10-16:30	1S3-2 Improvement of hydrogen storage performance of AB₂-type hydrogen storage alloy against CO₂ impurity K. Shinzato, V. Charbonnier, H. Cho, E.S. Cho, P. Á. Szilágyi, H. Kim, K. Asano, K. Sakaki
16:30-16:50	1S3-3 High-performance photon upconverting solid-state materials to increase solar utilization efficiencies in broad applications Riku Enomoto, Yoichi Murakami
16:50-17:10	1S3-4 Materials development for hydrogen compressors using hydrogen storage materials Kouji Sakaki, Veronique Charbonnier, Keita Shinzato, Hyunjeong Kim, Kohta Asano
17:10-17:30	1S3-5 Facile synthesis of effective cellulose-based anion exchange membrane for alkaline fuel cells

Kendall Paul A. Laureano, Richard DV. Espiritu

Room 2: Collaboration Room (West Bldg. 9)

1S4 Innovative Reactors and Fuels-1

Chair: Dr. Jason Hearne

13:30-13:50 **1S4-1 Safety Properties of High-Temperature Gas-Cooled Reactor Core Layouts to Directly Reuse HALEU Spent Fuel**

Hong Fatt Chong, Hiroshi Sagara

13:50-14:10 **1S4-2 Recycling RepU Containing Unseparated Np-137 to Improve the Sustainability and Proliferation-Resistance of Sodium-Cooled Fast Reactor Fuel Cycles**

Eva Lisowski, Hiroshi Sagara

14:10-14:30 **1S4-3 Contribution of HTGR hydrogen production technology toward decarbonization in the ironmaking sector**

Hiroki Noguchi, Katsunori Ishii, Masato Ono, Hiroyuki Sato, Nariaki Sakaba, Yunitaka Kato

14:30-14:40 Break

1S5 Innovative Reactors and Fuels-2

Chair: Dr. Hiroki Noguchi

14:40-15:00 **1S5-1 Scattering models and intrinsic neutron sources in molten salt fueled reactors**

Jason Hearne

15:00-15:20 **1S5-2 Offshore Floating Nuclear Power Plant From Fukushima Dai-Ichi Accident**

Takafumi Anegawa

15:20-15:40 **1S5-3 Neutronic Analysis and Optimization of a 100 MWe Modular Molten Salt Reactor for Archipelagic Regions**

Cici Wulandari, Marisa Variastuti, Sidik Permana, Dwi Irwanto, Abdul Waris

15:40 -16:00 **1S5-4 Effect of the Position of Freeze Valve Multi Channels on Core Discharge Rate and Pressure**

Amna Yasya Mubarak, Sidik Permana, Syaiful Bakhri, Ahmad Muzaki Maburi

16:00-16:10 Break

1S6 Novel Radionuclide Separation

Chair: Prof. Takuya Harada

16:10-16:30 **1S6-1 Facile Recovery of Platinum Group Metals Using Surface-Functionalized Porous PDMS Sponge**

Yang Zhang, Naokazu Idota, Takehiko Tsukahara

16:30-16:50 **1S6-2 Development on Mutual Separation of Lanthanides by Stimuli-Responsive Binary Polymer Brushes**

Tommy Suhartono Wijaya Tan, Naokazu Idota, Takehiko Tsukahara

16:50-17:10

1S6-3 Material Balance in MA Separation and Recycling for Environmental Load Reduction in Nuclear Fuel Cycle

Chi Young HAN, Hiroshi SAGARA, Hidekazu ASANO

17:10-17:30

1S6-4 Development of Spiropyran-Based Photoswitchable Adsorbents for Selective Recovery of Lanthanide ions

Kai Peng, Naokazu Idota, Takehiko Tsukahara

Room 3: Conference Room (West Bldg.8. 10F)

1S7 Decontamination of Radioactive Wastes

Chair: Prof. Masahiko Nakase

- 13:30-13:50 **1S7-1 Titanium modified adsorbent for radioactive liquid waste with easy handling throughout its life cycle -Sorption Behavior of Plutonium and Americium-**
Jun-ya Ibe, Hiroshi Hinai, Youko Takahatake, Sou Watanabe, Kimihiko Yano, Yoshikazu Koma, Jun Hashimoto
- 13:50-14:10 **1S7-2 Titanium modified adsorbent for radioactive liquid waste with easy handling throughout its life cycle, Properties of operation and after use**
Yoshikazu Koma, Youko Takahatake, Sou Watanabe, Tsuyoshi Arai, Jun Hashimoto, Kaname Kubo, Masashi Kaneko
- 14:10-14:30 **1S7-3 Titanium modified adsorbent for radioactive liquid waste with easy handling throughout its life cycle -Evaluation of basic adsorption properties and stability-**
Tsuyoshi Arai, Michika Kawaguchi, Youko Takahatake, Sou Watanabe, Yoshikazu Koma
- 14:30-14:40 Break

1S8 Radiochemistry and Nuclear Medicine-1

Chair: Dr. Yoshikazu Koma

- 14:40-15:00 **1S8-1 Evaluation of Leaching Behavior of Uranium from Simulated Fuel Debris Using Microfluidic Devices**
Tongyu Xu, Naokazu Idota, Yuma Dotsut, Yukihiro Sato, Toru Kitagaki, Takehiko Tsukahara
- 15:00-15:20 **1S8-2 Microfluidic Analysis of Aggregation and Dissolution Behaviour of Cerium Oxide Nanoparticles Generated from Nuclear Fuel Debris**
Yiwei Zhang, Cong Chao, Angeli Pangioti, Naokazu Idota, Miguel Pineda, Eric Fraga, Takehiko Tsukahara
- 15:20-15:40 **1S8-3 Optimizing Dose Evaluation of Targeted Alpha Therapy with Experiments and Simulation**
Yumin HUANG, Tetsuya Sakashita, Yasuhiro Ohshima, Ichiro Sasaki, Noriko S. Ishioka, Yoshihisa Matsumoto
- 15:40-15:50 Break

1S9 Radiochemistry and Nuclear Medicine-2

Chair: Prof. Tsuyoshi Arai

- 15:50-16:10 **1S9-1 Radionuclide Distribution And Geochemical Analysis In Mamuju Regency: Investigating Indonesia's Most Radioactive Region**
Adi Rahmansyah Amir Abdullah, Sidik Permana, Wahyu Srigutomo, Alan Maulana, Eka Djatnika Nugraha, Dwi Irwanto, Cici Wulandari, Haryo Seno, Dikdik Sidik Purnama, Ismail

- Humolungo, Zulfahmi
- 16:10-16:30 **1S9-2 Creation of Graphene-Macrocycle Hybrid Nanomaterials and Its Application to Cesium Separation**
- XU JIAWEI, Naokazu Idota, Takehiko Tsukahara
- 16:30-16:50 **1S9-3 Microfluidic Approach for Efficient Cesium Separation Using Deep Eutectic Solvents**
- Xinyi Qian, Naokazu Idota, Takehiko Tsukahara
- 16:50-17:10 **1S9-4 Deciphering the mechanisms of PNKP regulation toward improvement of cancer radiotherapy**
- Lingyan Fu, Rikiya Imamura, Tomoko Miyake, Kaima Tsukada, Yoshihisa Matsumoto, Mikio Shimada

Day 2

8:15- **Registration**

Room 1: Multi-Purpose Digital Hall (West Bldg. 9)

9:00-10:00 **EPRI Session on Energy Carrier**

Chair: Prof. Hiroki Takasu

EPRI-1: Perspectives on Policy Gaps and Drivers to Accelerate Adoption of Low-Carbon Fuels in Hard-to-Decarbonize Areas of the Economy

Jeffery Preece, Electric Power Research Institute

EPRI-2: Perspectives on Technology Gaps and Drivers to Accelerate Adoption of Low-Carbon Fuels in Hard-to-Decarbonize Areas of the Economy

Neil Kern, Electric Power Research Institute

10:00-10:10 Break

10:10-11:10 **EPRI Session on Energy Carrier**

Chair: Prof. Hiroki Takasu

EPRI-3: Green Growth Strategy Toward Net-Zero Emissions Energy Systems

Prof. Hiroshi Asano, Specially Appointed Professor for the Laboratory for Zero-Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo; Professor at Gifu Renewable Energy System Research Center, Gifu University; Research Advisor for the Central Research Institute of Electric Power Industry

EPRI-4: Necessity of a Hydrogen Society and Recent Development of AEM Water Electrolysis

Prof. Takeo Yamaguchi, Laboratory for Chemistry and Life Science, Institute of Integrated Research, Institute of Science Tokyo

With Panel Talk

11:10-11:20 Break

11:20-13:00 **Poster Short Presentation (2P01 ~ 2P51)**

Chair: Prof. Jun Hasegawa, Prof. Mikio Shimada

13:00-14:00 Lunch Break @Tsubame Terrace

Room 2: Collaboration Room (West Bldg. 9)

8:30-9:00 and
13:00-14:00 **Poster Preparation (2P01 ~ 2P51)**

13:00-14:00 Lunch Break @Tsubame Terrace

2P01 ~ 2P51 Poster Session

14:00-15:00 **Poster Preparation (ODD)**

15:00-16:00 **Poster Preparation (EVEN)**

2P01 Quantum beam analysis of fuel cell materials for automotive applications

Wataru Yoshimune

2P02 Osmotic power generation by mixing freshwater and saltwater: its domestic potential analysis

Kotomi Watanabe and Hiroyuki Shima

2P03 Experimental evaluation of an indirect heated fixed-bed reactor with calcium hydroxide for thermal energy storage

Tsuyoshi Izaki, Hana Saeki, Tsukasa Sugiyama, Kenta Tomita, Kyosuke Mochizuki, Shigehiko Funayama, Takashi Kato, Hiroki Takasu, Yukitaka Kato

2P04 Development of metal composite H₂-permeable membranes by a reverse build-up method

Yoshinari Hozumi, Ryu Hamamura, Sou Niwa, Shigehiko Funayama, Hiroki Takasu, Yukitaka Kato

2P05 Development of Metal-Supported Solid Oxide Electrolysis cell as carbon dioxide reduction technology for carbon recycling

Daisuke Moritomo, Rikuya Miyazaki, Yoshino Ikeda, Daiki Teshima, Yukitaka Kato, Hiroki Takasu

2P06 Impact of Uranium-silicide fuels on simultaneous enhancement of nuclear safety-security features and fuel lifetime extension in large scale LWRs

Mori Yusuke, Sagara Hiroshi, Chong Hong Fatt

2P07 Numerical validation of calcium oxide-based composites in an indirect fixed-bed reactor for thermochemical energy storage

Hana Saeki, Tsukasa Sugiyama, Tsuyoshi Izaki, Kenta Tomita, Soichiro Tamano, Shigehiko Funayama, Takashi Kato, Hiroki Takasu, Yukitaka Kato

2P08 Development of MgO-based carbon dioxide sorption material in presence of water vapor for Zero-Carbon Energy System

Yudai Yugami, Shigehiko Funayama, Hiroki Takasu, Yukitaka Kato

2P09 Application of LED 365 nm UV curing technology in anti-corrosion and thermal insulation coatings: Promoting energy efficiency and sustainable practices

Wei-Jun Chen, Yung-Chung Chen

2P010 Safeguards by design of sodium-cooled fast reactor with online re-fueling function

Shotaro Terayama, Hiroshi Sagara, Lisowski Eva

- 2P011 Preparation of Amorphous SiO₂ Coated Li₄Ti₅O₁₂ Anode and Their High Cycleability**
Ryota Nomura, Yoshinao Kobayashi and Shintaro Yasui
- 2P012 Investigation of novel composite solid electrolytes for sodium ion batteries**
Sosuke Takei, Rei Esaki, Ryota Nomura, Koki Imabayashi, Yoshinao Kobayashi, Shintaro Yasui
- 2P013 Novel sodium composite solid electrolyte formed by aqueous slurry**
Rei Esaki, Sosuke Takei, Ryota Nomura, Koki Imabayashi, Yoshinao Kobayashi, Shintaro Yasui
- 2P014 Modification Mechanisms of Alumina Inclusions in Molten Steel by Calcium Treatment**
Yuxing Liu, Shintaro Yasui, Yoshinao Kobayashi
- 2P015 Antiferroelectric Response of Titanite Film for High-voltage Energy Storage Application**
Yang Weirong, Kuwano Taro, Taniguchi Hiroki, and Yasui Shintaro
- 2P016 Preliminary analysis of the passive autonomous load following characteristics in the primary circuit of a small PWR**
XU Zongyu, Hiroki Takezawa
- 2P017 Estimating the origin of reprocessed Pu for Nuclear Forensics**
Hayato Sato, Hiroshi Sagara, Chi Young Han, Yoshiki Kimura, Kosuke Tanabe
- 2P018 Development of composite materials using calcium oxide for CO₂ capture and storage applications**
Kenta Tomita, Tsuyoshi Izaki, Guo Yue, Shigehiko Funayama, Hiroki Takasu, Yukitaka Kato
- 2P019 Applicability of passive neutron non-destructive assay technique -DDSI method- for Pu quantification in advanced fuels**
Aya Eguchi, Hiroshi Sagara, Matsumi Mitsuboshi, Taketeru Nagatani
- 2P020 Evaluation of Cathode α -NaFeO₂ for Sodium-Ion Batteries**
Koki Imabayashi
- 2P021 Magnetic flux pinning by adding oxide nanoparticles to superconducting Bi-2223 and Y-123 bulks**
Hiroshi Yamada
- 2P022 Spectroscopic Study of Rotational Temperatures CO-Excited States in Microwave Discharge CO₂ Plasma**
Hiroshi Akatsuka, Shota Yamada, Yuki Morita, Atsushi Nezu
- 2P023 Numerical Analysis of Plasma Based Ion Implantation Using Drifting Plasma**
Keisuke Noguchi, Shuta Mukoda, Jun Hasegawa
- 2P024 Effect of Magnetic Focusing on Ion Momentum Distribution in Laser-Produced Plasma**
Koki Yokoi, Yi-Ming Kao, Jun Hasegawa
- 2P025 Thermal and mechanical properties of AlN ceramics sintered with yttrium- and fluoride-based additives**
Katsumi Yoshida, Akira Murata, Ying Chung, Anna Gubarevich, Kinya Miyashita
- 2P026 Fabrication of texture-controlled Al₄SiC₄ ceramics by slip casting and their mechanical properties**

Yuka Yamaguchi, Anna Gubarevich and Katsumi Yoshida

- 2P027** **A Comparative Study of Questionnaire and Free Comment Surveys in the Annual Nuclear Energy Public Opinion Poll for a Deeper Understanding of Public Opinion**
HASHIMOTO Yuki, IKEGAMI Masako
- 2P028** **Chemoinformatic attempts to elucidate candidate extractant structures for enhanced MA separation**
Masahiko Nakase, Takahiro Nishihara, Tomohiro Okamura, Fauzia Hanum Ikhwan, Alaaeldine Shaker Mohammed Saleh and Kota Matsui
- 2P029** **Selection Method of Optimal Location for Offshore Wind Farm based on Short-term Wind Speed Prediction**
Botong Chen
- 2P030** **Carbon dioxide conversion technology at high temperatures using a metal-supported solid oxide electrolysis cell as a green transformation technology**
Hiroki Takasu, Daisuke Moritomo, Shigehiko Funayama, Yukitaka Kato
- 2P031** **Development of a Detection Technique for Nuclear Materials Using Gamma-rays from the Proton-Lithium Nuclear Reaction**
Tatsuya Katabuchi, Risa Kunitomo, Hiroshi Sagara, Chikako Ishizuka, Krittanai Kiatkongkaew, Kosuke Tanabe
- 2P032** **Comprehensive ilmenite modification in chemical looping processes to improve reactivity and H₂ yield**
Zhuang SUN, Junichiro OTOMO
- 2P033** **Measurement of chromium oxide activity in molten slag**
CHONGLIN SHI
- 2P034** **Beam simulation of a TE₂₁₁ mode single hybrid cavity linear accelerator**
Shota Ikeda, Noriyosu Hayashizaki
- 2P035** **Recognition and Repair of DNA Double-strand Breaks: Seeking for Molecular Mechanisms and Its Implication for Cancer Therapy and Radioprotection in Next Generation**
Yoshihisa Matsumoto, Mikio Shimada
- 2P036** **Development of PDMS-based Photonic Crystal Film for Uranyl Ion Sensing**
Ayumu Nagakawa, Naokazu Idota, and Takehiko Tsukahara
- 2P037** **Approach for smelting reduction process by carbon neutral reducing gas toward carbon circulating materials production system**
Yoshinao Kobayashi and Keisuke Nagase
- 2P038** **Creation of Graphene/PDMS Composite Sponge and Its Application to Uranium Decontamination**
Atsuro Furuichi, Naokazu Idota, Takehiko Tsukahara
- 2P039** **Conceptual study of a high burn-up demonstration high-temperature gas-cooled reactor**
Yuta Muramatsu
- 2P040** **Development of Photo-Swing Separation Technique for the Selective Recovery of Rare Metal**

Elements

Haruka Ban, Naokazu Idota, and Takehiko Tsukahara

- 2P041 Improvement of battery performance by annealing of LNMO**
Kentaro Murata, Masataka Ikeda, Ryota Nomura, Yoshinao Kobayashi and Shintaro Yasui
- 2P042 Microwave-Enhanced Dehydration of Calcium Hydroxide: Experimental and Numerical Insights for Thermochemical Energy Storage**
Massimiliano Zamengo, Hisahiro Einaga, Yuji Wada, Junko Morikawa
- 2P043 Epitaxial Growth of KNbO₃-based Ferroelectric Thin Films by Chemical Solution Decomposition**
Ayumu Masuda, Tatsuya Masuda, Yosuke Hamasaki, Yoshitaka Ehara, Hiroki Moriwake, Yoshinao Kobayashi, Shintaro Yasui
- 2P044 Development of Surface-Enhanced Raman Spectroscopic Technique for Simple and Rapid Uranium Analysis**
HE YANWEI, Naokazu Idota, and Takehiko Tsukahara
- 2P045 Selective Recovery of Platinum Group Metals from Waste Solutions Using Sulfur-containing Crosslinked Polymer**
DU YONGNAN, Naokazu Idota, and Takehiko Tsukahara
- 2P046 Effect of Structural Phase Transformation of Calcium Ferrite Oxygen Carrier on Redox Reactions in Chemical Looping Combustion**
Takayuki Kosaka, Junichiro Otomo
- 2P047 Creation of Novel Boron-Gadolinium Hybrid Nanosheets Towards Diagnostic and Therapeutic Nuclear Medicine**
Arisa Hatano, Naokazu Idota, and Takehiko Tsukahara
- 2P048 Roles of Solid State Ionics in Green Transformation Technology - Fuel Cell, Energy Carrier, Carbon Recycling –**
Junichiro Otomo
- 2P049 Development of a method to predict the possibility of forming covalent organic frameworks using quantum chemical calculations**
Tomoki Kitano and Yoichi Murakami
- 2P050 Electrochemical approach to CO₂ fixation using seawater**
Hiroki Hara, Shunsuke Ito, Yasuhide Mochizuki, Akira Nakajima, Toshihiro Isobe
- 2P051 High mass-loading of nickel-cobalt layered double hydroxide on 3D-printed electrode for cathode of asymmetric supercapacitor**
Hyojong Yoo

Day 3

8:30- **Registration**

Room 1: Multi-Purpose Digital Hall (West Bldg. 9)

9:00-10:00 **DLR Session on Energy Storage**

Chair: Prof. Shintaro Yasui

DLR-1: Thermal Energy Storage for Defossilisation of the Process Heat Sector

Dr. Thomas Bauer, Department of Thermal Process Technology, Institute of Engineering Thermodynamics, German Aerospace Center (DLR)

DLR-2: Thermochemical Energy Storage and Synergies with Hydrogen

Dr. Inga Bürger, Department of Thermal Process Technology, Institute of Engineering Thermodynamics, German Aerospace Center (DLR)

10:00-10:10 Break

10:10-11:10 **DLR Session on Energy Storage**

Chair: Prof. Shintaro Yasui

DLR-3: High Temperature Latent Heat Storage with Alloy Based Phase Change Material

Prof. Takahiro Nomura, Faculty of Engineering, Hokkaido University

DLR-4: Rechargeable Batteries for GX

Prof. Hajime Arai, Department of Chemical Science and Engineering, School of Materials and Chemical Technology, Institute of Science Tokyo

With Panel Talk

11:10-11:30 Break

3S10 Green Inorganic Materials

Chair: Prof. Sachiko Matsushita

11:30-11:50 **3S10-1 Effects of BN interphase thickness and the porosity of SiC matrix on mechanical properties of SiCf/SiC composites**

Daichi Sakakibara, Anna Gubarevich, Masaki Kotani, Katsumi Yoshida

11:50-12:10 **3S10-3 Effect of boron and carbon additives on SiC ceramics sintered by high-frequency induction heating**

Alin Yoshida, Anna Gubarevich, Katsumi Yoshida

12:10-12:30 **3S10-3 Electromagnetic induction-assisted synthesis and sintering method for high-performance boron carbide fabrication**

Anna Gubarevich, Yu Nakano, Katsumi Yoshida

12:30-13:30 Lunch Break @Tsubame Terrace

3S11 Thermal Storage and Use

Chair: Prof. Anna Gubarevich

13:30-13:50 **3S11-1 Power Generation Technology That Converts Unused Waste Heat into Electricity: Semiconductor-Sensitized Thermal Cell**

Sachiko Matsushita

13:50-14:10 **3S11-2 Novel heat storage materials developed by impregnating sugar alcohols into covalent organic frameworks**

Xiaohan Wang, Shoma Mitsui, Yoichi Murakami

14:10-14:30 **3S11-3 Hybrid thermal energy storage based on thermochemical energy storage and thermocline sensible thermal energy storage**

Shigehiko Funayama, Tsuyoshi Izaki, Hana Saeki, Kenta Tomita, Tsukasa Sugiyama, Kyosuke Mochizuki, Takashi Kato, Hiroki Takasu, Yukitaka Kato

14:30-14:40 Break

14:40-16:00 **GXI VISION 2050 Session**

Chair: Prof. Yoshinao Kobayashi

GXI-1: GXI VISION 2050 for Carbon Neutral Society

Prof. Yukitaka Kato, Director of and Professor for the Laboratory for Zero-Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo; Director of Science Tokyo GXI

GXI-2: The THREE Points of GXI VISION 2050

Prof. Takao Nakagaki, Specially Appointed Professor for the Laboratory for Zero-Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo; Professor for the Faculty of Science and Engineering, School of Creative Science and Engineering, Waseda University

GXI-3: Japan's Energy Basic Policy in GXI VISION 2050

Dr. Keigo Akimoto, Specially Appointed Professor for the Laboratory for Zero-Carbon Energy, Institute of Integrated Research, Institute of Science Tokyo; Group Leader/Chief Researcher, Systems Analysis Group, Research Institute of Innovative Technology for the Earth

GXI-4: Japan's Nuclear Policy in GXI VISION 2050

Prof. Kenji Takeshita, Senior Aide to the Executive Vice President for Research; Professor Emeritus/Specially, Appointed Professor, Institute of Science Tokyo

15:60-16:30

Closing Ceremony / Award Ceremony

Chair:

Prof. Shintaro Yasui

Prof. Jun Hasegawa, Technical Program Committee of GXI-ZES, Science Tokyo

Prof. Hiroshi Sagara, Chair of GXI-ZES, Science Tokyo

Room 2: Collaboration Room (West Bldg. 9)

3S12 Nuclear Reactions and Applications-1

Chair: Prof. Hiroshi Akatsuka

11:30-11:50 **3S12-1 Improved Method for Calculating the Conversion Efficiency of Direct Charge Nuclear Battery by Using the PHITS code**

Hiroki Takezawa, Bin Zeng

11:50-12:10 **3S12-2 Numerical Analysis of Photonuclear Reaction Detection using High Energy Gamma-ray from $7\text{Li}(p,g)8\text{Be}$ Triggered by Proton Accelerator**

Krittana Kiatkongkaew, Hiroshi Sagara, Kosuke Tanabe, Tatsuya Katabuchi, Chikako Ishizuka, Risa Kunitomo

12:10-12:30 **3S12-3 Development of Machine Learning Model for Nuclear Fission Data**

Chikako Ishizuka, Jingde Chen, Yusuke Mukobara, Osamu Iwamoto, Satoshi Takeda, Masaomi Ueno

12:30-13:30 Lunch Break @Tsubame Terrace

3S13 Nuclear Reactions and Applications-2

Chair: Prof. Hiroki Takezawa

13:30-13:50 **3S13-1 Angular Distribution of Neutron Flux from a Linear Inertial Electrostatic Confinement Fusion Device**

Koshiro Arai, Jun Hasegawa

13:50-14:10 **3S13-2 Measurement of neutron capture cross sections of Tc-99 at ANNRI of J-PARC MLF**

Chikako Ishizuka, Jingde Chen, Yusuke Mukobara, Osamu Iwamoto, Satoshi Takeda, Masaomi Ueno, M. Maloney, T. Katabuchi, C. Ishizuka, G. Li, H. Kondo, J. Han, Z. Shao, G. Rovira, S. Endo, A. Kimura, S. Nakamura

Room 3: Conference Room (West Bldg.8. 10F)

3S14 Energy Policy, Economics, Material Recycling-1

Chair: Dr. Tomohiro Okamura

11:30-11:50 **3S14-1 Development of Material Recycling Technology for GHG Reduction in Semiconductor Manufacturing**

Atsushi Morihara, Yoshihiko Kato, Koichi Imamura, Shunsuke Michigami

11:50-12:10 **3S14-2 Study on Analytical Evaluation of Radiological Impacts due to Sabotage against Spent Nuclear Fuel Transport Package**

Kanichi Oyama, Makoto Hirose, Susumu Ozaki, Hiroshige Kikura

12:10-12:30 **3S14-3 Technologies and issues in steel manufacturing process toward the achievement of carbon-neutral steel industry**

Hiroyuki Matsuura

12:30-13:30 Lunch Break @Tsubame Terrace

3S15 Energy Policy, Economics, Material Recycling-2

Chair: Prof. Hiroyuki Matsuura

13:30-13:50 **1S15-1 Current Status and Next Development of Fuel Cycle Analysis Technique for the Future Scenarios: Research Committee on Fuel Cycle Analysis Technique for Future Nuclear Scenarios in Atomic Energy Society**

Kenji Takeshita, Tomohiro Okamura, Naoto Aizawa, Masahiko Nakase, Takashi Shimada, Kenji Nishihara

13:50-14:10 **1S15-2 Three Years of NMB4.0: A Driving Force Toward Nuclear Innovation Through Open Access Nuclear Fuel Cycle Simulator Development**

Tomohiro Okamura, Takumi Abe, Taiga Suzuki, Masahiko Nakase, Kenji Takeshita, Kenji Nishihara

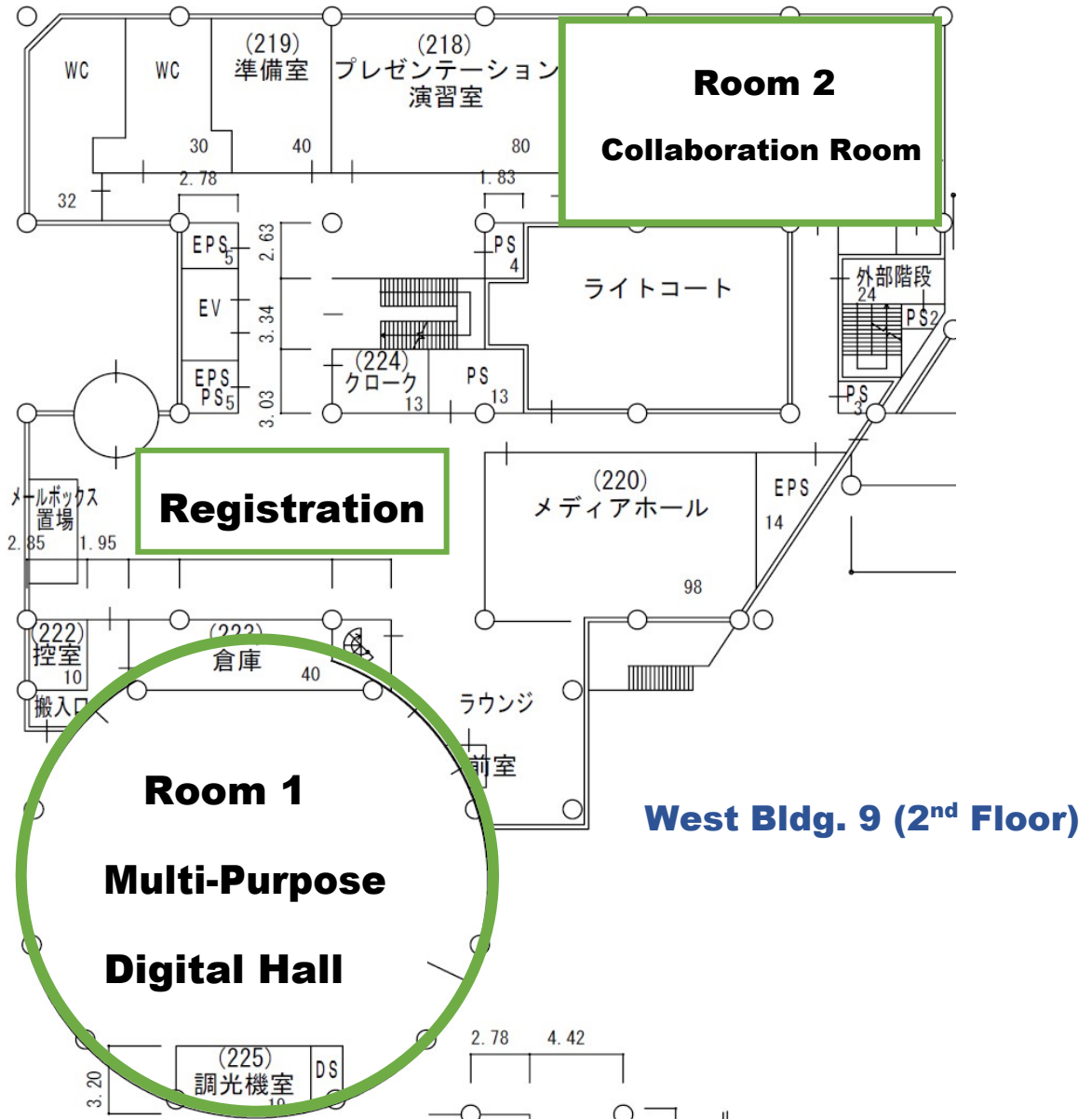
14:10-14:30 **1S15-3 Evaluation of Measures for Enhancing the Efficiency of International Safeguards Activities Applied to SMRs**

Koji Tsutsui, Hiroshi Sagara

Rooms

Science Tokyo, Ookayama Campus

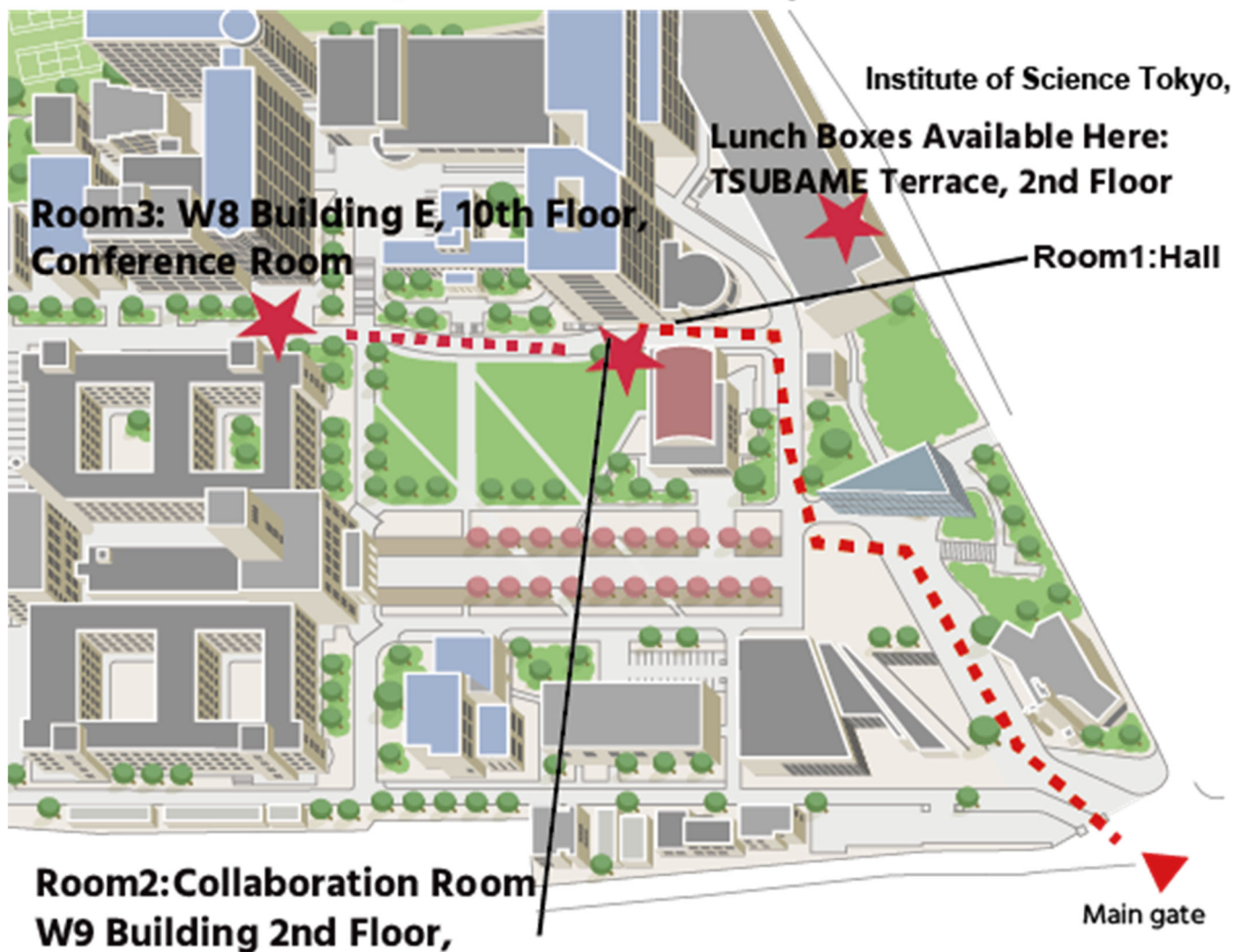
<https://www.isct.ac.jp/en/001/about/campuses-and-offices/ookayama>



Venue

Science Tokyo, Okayama Campus

From Okayama St. to the Registration Venue



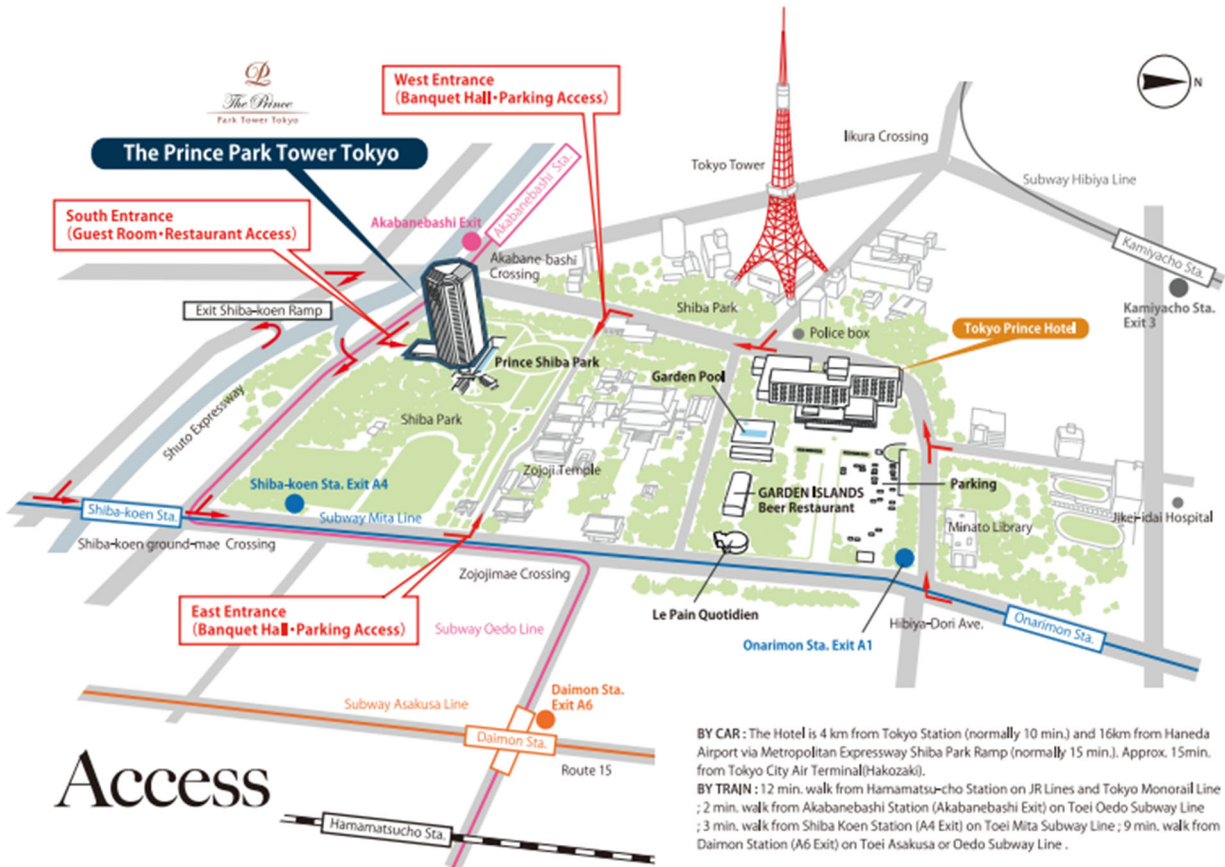
Reception Party

At 18:00-19:30 on 15th January, 2025

The Prince Park Tower Tokyo

Sky Banquet (33F)

<https://www.princehotels.com/parktower/map-direction/>



Located in the heart of Tokyo very close to the city's landmark Tokyo Tower and within easy reach of two different subway lines, the Toei Oedo Line and Toei Mita Line. From Shibakoen Station of Toei Subway Mita Line: about 3 minutes on foot.

It takes about 17 minutes from Ookayama Sta. to Shiba-koen Sta.

Science Tokyo Campus Map



Location: 2-12-1 Ookayama, Meguro-ku, Tokyo 152-8550 Japan

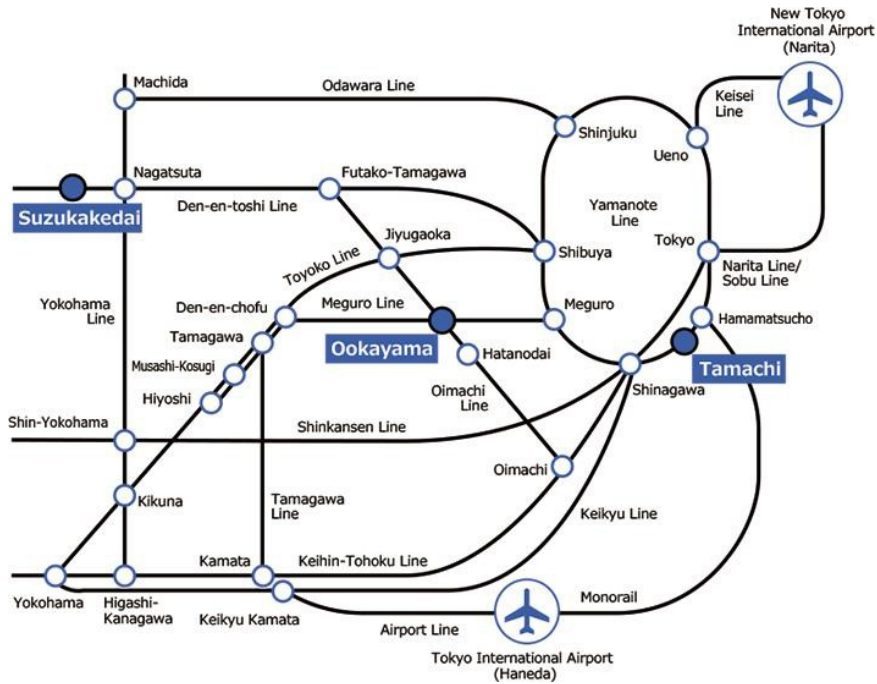
Nearest stations

The Main Gate is a 1-minute walk from Ookayama Station on the Tokyu Oimachi and Tokyu Meguro Lines.

The West Gate is a 3-minute walk from Midorigaoka Station on the Tokyu Oimachi Line.

The Midorigaoka Gate is a 1-minute walk from Midorigaoka Station on the Tokyu Oimachi Line.

The South Gate is a 7-minute walk from Ishikawadai Station on the Tokyu Ikegami Line.



● **From Narita Airport**
(recommended route - approx.
85 min.)

Narita Airport (terminal 1 or 2) Station (Keisei)

Keisei Skyliner bound for Nippori and Ueno (approx. 40 min.)

Nippori Station (Keisei)

walk (approx. 5 min.)

Nippori Station (JR)

JR Keihin Tohoku Line bound for Ofuna and Isogo (approx. 25 min.)

Oimachi Station (JR)

walk (approx. 5 min.)

Oimachi Station (Tokyu)

Tokyu Oimachi Line bound for Mizonokuchi and Nagatsuta (approx. 10 min.)

Ookayama Station (Tokyu)

● Search for alternate routes

● **From Haneda Airport**
(recommended route - approx.
55 min.)

Haneda Airport Station (Tokyo Monorail)

Tokyo Monorail bound for Hamamatsucho (approx. 25 min.)

Hamamatsucho Station (Tokyo Monorail)

walk (approx. 5 min.)

Hamamatsucho Station (JR)

JR Keihin Tohoku Line bound for Ofuna and Isogo (approx. 10 min.)

Oimachi Station (JR)

walk (approx. 5 min.)

Oimachi Station (Tokyu)

Tokyu Oimachi Line bound for Mizonokuchi and Nagatsuta (approx. 10 min.)

Ookayama Station (Tokyu)

● **From Tokyo Station**
(recommended route - approx.
30 min.)

Tokyo Station (JR)

JR Keihin Tohoku Line bound for Ofuna and Isogo (approx. 15 min.)

Oimachi Station (JR)

walk (approx. 5 min.)

Oimachi Station (Tokyu)

Tokyu Oimachi Line bound for Mizonokuchi and Nagatsuta (approx. 10 min.)

Ookayama Station (Tokyu)

● Search for alternate routes