

IZES



International Symposium on Zero-Carbon Energy Systems

Program

10th January – 12th January, 2023

Tokyo Institute of Technology, Japan

Organized by:

- Organizing Committee of IZES
- Laboratory for Zero-Carbon Energy (ZC), Institute of Innovative Research (IIR), Tokyo Institute of Technology (Tokyo Tech)
- Green Transformation Initiative at Tokyo Tech (Tokyo Tech GXI)

Supported by:

- Tokyo Tech Academy of Energy and Informatics (InfoSyEnergy)
- Tokyo Tech Academy for Convergence of Materials and Informatics (TAC-MI)
- MIT Center for Advanced Nuclear Energy Systems (MIT-CANES)
- Japan Atomic Energy Agency (JAEA)
- Japan Association of Solvent Extraction (JASE)
- The Chemical Society of Japan (CSJ)
- The Electrochemical Society of Japan (ECSJ)
- Japan Society of Nuclear and Radiochemical Sciences (JNRS)
- The Japan Society for Analytical Chemistry (JSAC)
- Atomic Energy Society of Japan (AESJ)
- The Japan Society of Plasma Science and Nuclear Fusion Research (JSPF)

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IZES Schedule

Jan. 10	Room A, Multi-Purpose Digital Hall (West Bldg. 9)	Room B, Collaboration Room (West Bldg. 9)	Room C, EEI Hall (North Bldg. 3)
8:30	Registration		
9:00	Opening Ceremony General Chair, Prof. Kato President, Prof. Masu		
9:30	Plenary Lecture 1 Dr. Pei		
10:00			
10:30	Plenary Lecture 2 Prof. Yamaguchi		
11:00			
11:30	Group Photo		
12:00			
12:30			Lunch
13:00	A11 Innovative Nuclear Technology, Nuclear Reactor I	B11 Carbon Neutral Technology I	
13:30			
14:00			
14:30	Break		
15:00	A12 Innovative Nuclear Technology, Nuclear Reactor II	B12 Carbon Neutral Technology II	
15:30			
16:00	Break		
16:30	A13 Innovative Nuclear Technology, Nuclear Energy System, Nuclear Plant Safety	B13 Innovative Nuclear Technology, Nuclear Waste	
17:00			
17:30			

Jan. 11	Room A, Multi-Purpose Digital Hall (West Bldg. 9)	Room B, Collaboration Room (West Bldg. 9)	Room C, EEI Hall (North Bldg. 3)
8:30	Registration		
9:00	Plenary Lecture 3 Prof. Wainwright		
9:30			
10:00	Plenary Lecture 4 Mr. Bessiron		
10:30			
11:00	Break		
11:30	A21 Innovative Nuclear Technology IV, Nuclear Fuel Cycle Strategy I	B21 Material Recycling Technologies for Energy Systems	
12:00			
12:30			
13:00			Lunch
13:30			
14:00	A22 Innovative Nuclear Technology V, Nuclear Fuel Cycle Strategy II	B22 Innovative Nuclear Technology, Environment, Resilience, Non- proliferation	
14:30			
15:00	Break		
15:30		B23 Innovative Nuclear Technology, Proliferation Resistance, Nuclear Security	
16:00	A23 Innovative Nuclear Application, Separation, Chemical Analysis		
16:30			
17:00			
17:30			
18:00	Reception Party @Royal Blue Hall (Tokyo Tech Front)		
~20:00			

Jan. 12	Room A, Multi-Purpose Digital Hall (West Bldg. 9)	Room B, Collaboration Room (West Bldg. 9)	Room C, EEI Hall (North Bldg. 3)
8:30	Registration		
9:00	A31 Innovative Nuclear Technology, Reprocessing, Separation	B31 Renewable Energy, Energy Storage Break	
9:30			
10:00		B32 Innovative Nuclear Technology and Application	Poster Short Presentation IZES
10:30	Break		
11:00	A32 Innovative Nuclear Technology, Material		Poster Short Presentation AESJ
11:30			
12:00			Poster Session with Lunch IZES AESJ
12:30			
13:00			
13:30			
14:00			
14:30	Plenary Lecture 5 Prof. Akimoto		
15:00			
15:30	Closing Ceremony Prof. Obara		
16:00			
16:30			
17:00			
17:30			

Program

Day 1

8:30- **Registration**

Room A, Multi-Purpose Digital Hall (West Bldg. 9)

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

Chair: Prof. Toru Obara

Prof. Yukitaka Kato, General Chair of IZES, Tokyo Tech

Prof. Kazuya Masu, President of Tokyo Tech

9:30-10:30 **Plenary Lecture1,**

Chair: Prof. Yukitaka Kato

**Dr. Martin Pei, “Transformation to fossil free steel with the HYBRIT technology”
(Executive Vice President & CTO, SSAB AB)**

10:30-11:30 **Plenary Lecture2,**

Chair: Prof. Hiroki Takasu

Prof. Takeo Yamaguchi, “Systematic material design and development for polymer electrolyte fuel cells and anion exchange membrane water electrolysis” (Tokyo Tech)

11:30-11:40 Group Photo

11:40-13:00 Lunch Break @Room C, EEI Hall (North Bldg. 3)

A11 Innovative Nuclear Technology, Nuclear Reactor I

Chair: Dr. Koji Fujimura

13:00-13:20 **A11-1 Small modular reactor concept sustainable in carbon neutral society**

Toru Obara, Ren Horikoshi, Sambuu Odmaa, Jun Nishiyama

13:20-13:40 **A11-2 Coolant void coefficient in sodium-cooled rotational fuel shuffling Breed-and-Burn fast reactor**

Tsendsuren Amarjargal, Jun Nishiyama and Toru Obara

13:40-14:00 **A11-3 Comparison of burnup performance between lead coolant and LBE coolant in Rotational Fuel-shuffling Breed-and-Burn fast reactor**

Xucheng Zhao, Jun Nishiyama, Toru Obara

14:00-14:20 **A11-4 Breed and burn reactor concept to maximize uranium utilization without fuel shuffling**

Tomohiro Yamashita, Naoyuki Takaki

14:20-14:40 **A11-5 Small CANDLE Burnup Reactor for Space Nuclear Power**

Jun Nishiyama

A12 Innovative Nuclear Technology, Nuclear Reactor II

Chair: Prof. Jun Nishiyama

14:50-15:10 **A12-1 Core Concept of Innovative Small SFR with Metal Fuel for Deployment in Japan**

Sho Fuchita, Koji Fujimura, Daisuke Watanabe, Hirotaka Nakahara, Kazuhiko Matsumura
Hirokazu Ohta, Masatoshi Iizuka

15:10-15:30 **A12-2 Study on Load Following of a Molten Chloride Salt Fast Reactor**

Hiroyasu Mochizuki, Masahiko Nakase

15:30-15:50 **A12-3 Conceptual Design of Small Modular Lead-cooled Reactor with 400MWth**

Shaojian Yan, Feng Lin, Qingsheng Wu

15:50-16:10 **A12-4 Concepts Design of External Neutron Source Driven Advanced Nuclear Energy System**

Yunqing Bai, Chao Liu, Chao lian, Jianwei Chen

A13 Innovative Nuclear Technology, Nuclear Reactor III, Nuclear Safety

Chair: Prof. Hiroyasu Mochizuki,

16:20-16:40 **A13-1 Dynamic Modeling of HTGR-renewable Hybrid System for Power Grid Simulation**

Hiroyuki Sato, Xing L. Yan

16:40-17:00 **A13-2 Transient Thermal-hydraulic Analysis for Thermal Load Fluctuation Test using HTTR**

Takeshi Aoki, Hiroyuki Sato

17:00-17:20 **A13-3 Development of a Passive Safety Shutdown Device to Prevent Core Damage Accidents in Fast Reactors (1) Current Status of Overall Project Progress**

Koji Morita, Wei Liu, Tatsumi Arima, Yuji Arita, Isamu Sato, Haruaki Matsuura, Yoshihiro Sekio,
Hiroshi Sagara, Masatoshi Kawashima

17:20-17:40 **A13-4 Development of a Passive Safety Shutdown Device to Prevent Core Damage Accidents in Fast Reactors (2) Performance of the Device in Reactivity Control and Nuclear Material Management**

Hiroshi Sagara, Masatoshi Kawashima, Koji Morita, Wei Liub, Tatsumi Arima, Yuji Arita, Isamu Sato, Haruaki Matsuura, Yoshihiro Sekio

17:40-18:00 **A13-5 CFD Analysis of Thermal Radiation Effects on Large Containment CIGMA Vessel with Weighted Sum of Gray Gases (WSGG) Model**
Ari Hamdani, Shu Soma, Satoshi Abe, Yasuteru Sibamoto

Room B Collaboration Room (West Bldg. 9)

B11 Carbon Neutral Technology I

Chair: Dr. Odtsetseg Myagmarjav

13:00-13:20 **B11-1 Rapid Sintering of SiC Ceramics Assisted by High-Frequency Induction Heating**
Alin Hancharoen, Anna Gubarevich, Katsumi Yoshida

13:20-13:40 **B11-2 Chemical Analysis of Sn Speciation in Silicate Glass Containing Iron Oxide**
Yoshitaka Saijo, Makiko Murata, Yuichi Suzuki, Ryoji Akiyama, Takato Kajihara, Hiroyuki Hijjiya, Naoki Kanno, Masahiko Nakase

13:40-14:00 **B11-4 Valence separation of Fe and removal of Sn²⁺ by solvent extraction as a potential method to determine Fe²⁺ in glass containing Sn²⁺**
Naoki Kanno, Masahiko Nakase, Yoshitaka Saijo, Daiju Matsumura, Takuya Tsuji, Kenji Takeshita, Takehiko Tsukahara

14:00-14:20 **B11-5 Mechanical, Thermal and Sliding Properties of Nano-crystal Structured Zirconia Coating by AD Method**
Ryoto Takizawa, Katsumi Yoshida

B12 Carbon Neutral Technology II

Chair: Prof. Masahiko Nakase

14:50-15:10 **B12-1 Effects of Sintering Atmosphere and Form of Al and B addition on Thermal and Electrical Properties of Silicon Carbide Ceramics**
Ying Chung, Anna Gurabrevich, Katsumi Yoshida

15:10-15:30 **B12-2 Fabrication of Palladium-Copper Alloy Membranes for Hydrogen Purification Using a Reverse Build-up Method**
Yasunari Shinoda, Kohei Harada, Ryu Hamamura, Hiroki Takasu, Yukitaka Kato

15:30-15:50 **B12-3 Oxidation Behavior of Al₄SiC₄-Based Ceramics at 1623 K**
Atsuko Tanaka, Anna Gubarevich, Toshiyuki Nishimura, Katsumi Yoshida

15:50-16:10 **B12-4 Fabrication of Corrosion-stable Ceramic Membranes for Hydrogen Production via Thermochemical Iodine-sulfur Process**
Odtsetseg Myagmarjav, Nobuyuki Tanaka, Hiroki Noguchi, Yu Kamiji, Masato Ono, Mikihiro Nomura, Hiroaki Takegami

- B13 Innovative Nuclear Technology, Nuclear Waste**
Chair: Dr. Hidekazu ASANO
- 16:20-16:40 **B13-1 Temperature Swing Extraction for U Recovery from Leaching Solution of U Wastes**
Sou Watanabe, Youko Takahatake, Madoka Saito, Toshihiro Iwamoto, Masayuki Watanabe, Akihiko Kajinami, Atsuki Naruse, Takehiko Tsukahara
- 16:40-17:00 **B13-2 Achievements and current status of STRAD project for radioactive liquid waste management**
Y. Arai, S. Watanabe, M. Nakahara, H. Aihara, T. Funakoshi, T. Hoshino, Y. Takahatake, A. Sakamoto, K. Hasegawa, T. Yoshida, T. Iwamoto, M. Watanabe
- 17:00-17:20 **B13-3 Development of treatment method for analytical waste solutions in STRAD project - Oxidation reaction of ammonium ions by ozone in the presence of Co(II)**
Haruka Aihara; Sou Watanabe; Shinichi Kitawaki; Yuichi Kamiya
- 17:20-17:40 **B13-4 Development of Treatment Method for Analytical Waste Solutions in STRAD Project - Separation of Ammonia by Vaporization**
Haruaki Matsuura, Takahiro Watanabe, Aya Maruyama, Ami Kobayashi, Masahide Miyoshi, Haruka Aihara, Sou Watanabe

Day 2

8:30- Registration

Room A, Multi-Purpose Digital Hall (West Bldg. 9)

9:00-10:00 **Plenary Lecture3**

Chair: Prof. Hiroshi Sagara

Prof. Haruko M Wainwright, “Environmental Science for Sustainable Energy.” (MIT)

10:00-11:00 **Plenary Lecture4**

Chair: Prof. Kenji Takeshita

Mr. Vincent BESSIRON, “New Dynamics of the Nuclear Energy in France: a Pillar to Reach Carbon Neutrality” (President, Framatome Japan KK)

A21 Innovative Nuclear Technology, Nuclear Fuel Cycle Strategy I

Chair: Prof. Tatsuya Suzuki

11:05-11:25 **A21-1 Scenario Analysis of Future Nuclear Energy Use in Japan: (1)Methodology of Nuclear Fuel Cycle Simulator: NMB4.0**

Takumi Abe, Akito OIZUMI, Kenji NISHIHARA, Masahiko NAKASE, Hidekazu ASANO, Kenji TAKESHITA

11:25-11:45 **A21-2 Scenario Analysis of Future Nuclear Energy Use in Japan: (2) Analysis of the Impact on Front and Back-end processes Assuming the Variation of Operating Conditions of Rokkasho Reprocessing Plant Using**

Tomohiro OKAMURA, Akito OHIZUMI, Kenji NISHIHARA, Masahiko NAKASE, Hidekazu ASANO, Kenji TAKESHITA

11:45-12:05 **A21-3 Scenario Analysis of Future Nuclear Energy Use in Japan: (3) Promotion of Plutonium Utilization by RBWR-Backfit**

Kenji Nishihara, Akito Oizumi, Tetsushi Hino, Hideo Soneda

12:05-12:25 **A21-4 Scenario Analysis of Future Nuclear Energy Use in Japan: (4) Impact of utilization of MOX fuel in LWRs on the long-term safety for geological disposal of HLWs**

Eriko MINARI, Satsuki KABASAWA, Morihito MIHARA, Hitoshi MAKINO, Masahiko NAKASE, Hidekazu ASANO, Kenji TAKESHITA

12:25-12:45 **A21-5 Scenario Analysis of Future Nuclear Energy Use in Japan; (5) Analysis of LWR long-term utilization scenarios**

Kenji TAKESHITA, Tomohiro OKAMURA, Kenji NISHIHARA, Naoya SHIGEKIYO, Eriko

- 12:45-13:45 Lunch Break @Room C, EEI Hall (North Bldg. 3)
- A22**
Chair: Dr. Kenji Nishihara
- 13:45-14:05 **A22-1 Study on Nuclear Energy System Considering Environmental Load Reduction of Waste Disposal in Diversification of Nuclear Fuel Cycle Conditions; (1)Evaluation of Repository Footprint and Radiation Effect**
Ryo Hamada, Hidekazu Asano, Tomofumi Sakuragi, Chi Young Han, Masahiko Nakase, Tatsuro Matsumura, Go Chiba, Hiroshi Sagara and Kenji Takeshita
- 14:05-14:25 **A22-2 Study on Nuclear Energy System Considering Environmental Load Reduction of Waste Disposal in Diversification of Nuclear Fuel Cycle Conditions; (2) Impact of MA Separation and Recycle on the Material Balance of Nuclear Fuel Cycle**
Chi Young Han, Hiroshi Sagara, Hidekazu Asano, Tomofumi Sakuragi, Ryo Hamada, Go Chiba, Masahiko Nakase, Tatsuro Matsumura, and Kenji Takeshita
- 14:25-14:45 **A22-3 Study on Nuclear Energy System Considering Environmental Load Reduction of Waste Disposal in Diversification of Nuclear Fuel Cycle Conditions; (3) Simplification of MA Separation Process**
Tatsuro Matsumura, Hidekazu Asano, Tomofumi Sakuragi, Ryo Hamada, Chi Young Han, Masahiko Nakase, Go Chiba, Hiroshi Sagara, Kenji Takeshita
- 14:45-15:05 **A22-4 Study on Nuclear Energy System Considering Environmental Load Reduction of Waste Disposal in Diversification of Nuclear Fuel Cycle Conditions; (4) Impact of the Spent Fuel Reprocessing Conditions on Fast Reactor Neutronics Property**
Go Chiba, Hidekazu Asano, Tomofumi Sakuragi, Ryo Hamada, Chi Young Han, Masahiko Nakase, Tatsuro Matsumura, Hiroshi Sagara and Kenji Takeshita
- 15:05-15:25 **A22-5 Study on Nuclear Energy System Considering Environmental Load Reduction of Waste Disposal in Diversification of Nuclear Fuel Cycle Conditions; (5) Environmental Impact Assessment of Nuclear Energy System and Selection of Nuclear Fuel Cycle Options using Cross-disciplinary Approach and Multi-criteria Analysis**
Hidekazu Asano, Tomofumi Sakuragi, Ryo Hamada, Chi Young Han, Masahiko Nakase, Tatsuro Matsumura, Go Chiba, Hiroshi Sagara and Kenji Takeshita
- A23**
Chair: Dr. Tatsuro Matsumura
- 15:40-16:00 **A23-1 Extraction Behavior of the Lightest Actinide, Actinium, for Targeted Alpha Therapy**
Masahiko Nakase, Kenji Shirasaki, Miki Harigai, Shingo Sugawara, Shinta Watanabe, Chihiro

- Tabata, Tomoo Yamamura
- 16:00-16:20 **A23-2 Thermochemical Conversion of Uranium Oxides for Pretreatment of Nuclide Analysis**
- Ma Zhuoran
- 16:20-16:40 **A23-3 A direct conversion method for the separation and temporary storage of MA**
- Tomoo Yamamura, Masahiko Nakase, Kenji Takeshita, Takashi Shimada, Koichi Kakinoki, Taisuke Tsukamoto, Hitomi Ishida, Ryo Takahashi
- 16:40-17:00 **A23-4 Mutual Actinide Separation by Column Separation Method using Impregnated Resins for High Accurate Actinide Analysis**
- Fauzia Hanum Ikhwan, Chikage Abe, Kenji Konashi and Tatsuya Suzuki

Room B Collaboration Room (West Bldg. 9)
B21 Material Recycling Technologies for Energy Systems

Chair: Prof. Massililiano Zamengo

- 11:05-11:25 **B21-1 The Role of Electrochemical Separations for Sustainable Energy Materials Recycling**
- Xiao Su
- 11:25-11:45 **B21-2 Investigation on Fission Product Utilization under the TCU's Priority Promotion Research**
- Isamu Sato, Naoki Tarumi, Asahi Nitta, Haruaki Matsuura
- 11:45-12:05 **B21-3 Creation of Novel PDMS Sponge Enabling Adsorb and Release Lanthanide Ions**
- Yiwei Zhang, Ki Chul Park, Naokazu Idota, Takehiko Tsukahara
- 12:05-12:25 **B21-4 Stimuli-Responsive Adsorption-Desorption of Lanthanides using Zwitterionic Polymer Brushes**
- Tommy Suhartono Wijaya Tan, Naokazu Idota, and Takehiko Tsukahara
- 12:25-12:45 **B21-5 Novel Fiber Reinforced Concrete based on Liquid Metal Technology toward Resource Recycling Society**
- Masatoshi KONDO, Yuki Kano, Yoshiki Kitamura, Nobuhiro Chijiwa, Minh O

12:45-13:45 Lunch Break @Room C, EEI Hall (North Bldg. 3)

B22 Innovative Nuclear Technology, Environment, Nuclear Nonproliferation

Chair: Dr. Yoshiki Kimura

- 13:45-14:05 **B22-1 Monitoring Technologies for Environmental Resilience in Nuclear Energy**
- Haruko Wainwright

- 14:05-14:25 **B22-2 The Functional Analysis of Genetic Disease Factor APTX in DNA Double Strand Break Repair**
Rikiya Imamura, Mizuki Saito, Mikio Shimada, Masamichi Ishiai, Yoshihisa Matsumoto
- 14:25-14:45 **B22-3 Lightbridge Nuclear Fuel Recycling to Strengthen Nuclear Nonproliferation**
Braden Goddard and Sunil S. Chirayath
- 14:45-15:05 **B22-4 Development of a Method for the Determination of Spontaneous Fission Nuclides in Irradiated Fuel and Applicability to Pu quantification in Fuel Debris by Dual Time Neutron Measurements**
Taketeru Nagatani, Hiroshi Sagara, Yoshihiro Kosuge, Takayoshi Nohmi, Keisuke Okumura
- B23 Innovative Nuclear Technology, Proliferation Resistance, Nuclear Security**
Chair: Prof. Sunil S. Chirayath
- 15:20-15:40 **B23-1 Evaluation for Proliferation Resistance of small and medium modular LWR with U₃Si₂ fuel**
Natsumi Mitsuboshi, Hiroshi Sagara
- 15:40-16:00 **B23-2 Proliferation Resistance Analysis of Offshore Floating Nuclear Power Plant**
Daisuke Hara, Hiroshi Sagara
- 16:00-16:20 **B23-3 Mobile Radiation Measurement System by Multiple Small Gamma-ray Detectors for Radioisotope Detection and Identification Supporting Responders in the Field of Nuclear Detection and Nuclear Security**
Yoshiki Kimura, Tomoki Yamaguchi
- 16:20-16:40 **B23-4 Characterization of water Cherenkov neutron detector with high efficiency, availability and affordability for nuclear security**
Kosuke Tanabe, Masao Komeda, Yosuke Toh, Hiroshi Sagara

Day 3

8:30- Registration

Room A **Multi-Purpose Digital Hall (West Bldg. 9)**

A31 Innovative Nuclear Technology, Reprocessing, Separation

Chair: Prof. Koichiro Takao

9:00-9:40 **A31-1 Mechanism of ZMH formation and challenge to prevent ZMN encrustation**
I. Hirasawa, K. Kamoi, K. Sue, M. Takeuchi, Y. Miyazaki

9:20-9:40 **A31-2 Development of high performance clarification system for spent MOX fuel reprocessing**
Masayuki Takeuchi, Takeshi Takata, Keita Saito, Takahiro Chikazawa

9:40-10:00 **A31-3 Dissolution of Thorium Dioxide in Aqueous Solution by using Thermochemical Conversion**
Feng Yin

10:00-10:20 **A31-4 Fundamental study on thorium fuel reprocessing by using phosphate-type fluorous extractant/ fluorous solvent and TOMAC/OMITf2N extraction systems**
Masaru Yokouchi, Ryoma Sunakawa, Toshiyuki Inazu, Noriko Asanuma

10:20-10:40 **A31-5 A Basic Study for Radioactive Nuclides Recovery from Spent PUREX Solvent using Adsorbents**
Tsuyoshi Arai, Fumiya Nakamura, Ryoji Abe, Fuga Ueno, Noriaki Seko, Yoichi Arai, Sou Watanabe

A32 Innovative Nuclear Technology, Material

Chair: Prof. Tsuyoshi Arai

11:00-11:20 **A32-1 Material development to foster liquid metals as enabling technology for future net zero energy technologies and more**
Alfons Weisenburger, Renate Fetzer, Joachim Fuchs, Annette Heinzl, Wolfgang Hering, Klariss Niedermeier, Georg Müller, Robert Stieglitz, Thomas Wetzel

11:20-11:40 **A32-2 Helium Gas Release Behavior of Highly Microstructure-Controlled B4C-Based Ceramics Irradiated with Helium Ion Beam**
Katsumi Yoshida, Ryosuke Maki, Jelena Maletaskic, Anna Gubarevich, Tatsuya Katabuchi, Tohru S. Suzuki, Tetsuo Uchikoshi

11:40-12:00 **A32-3 Beam-On Effects in Nuclear Materials for Generation IV Fission and Fusion Reactors**
Weiyue Zhou, Kevin B. Woller, Guiqiu (Tony) Zheng, Nouf. M. AlMousa, Peter W. Stahle, Yang Yang, Andrew M. Minor, Alexis Devitre, David Fischer, Zachary S. Hartwig, Dennis G. Whyte, Michael P. Short

14:30-15:30

Plenary Lecture5

Chair:

Prof. Jun Hasegawa

Prof. Keigo Akimoto, “Climate change mitigation measures for the carbon neutrality and the transition” (RITE and Tokyo Tech)

15:30-16:00

Closing Ceremony

Chair:

Prof. Tsukahara

Prof. Toru Obara, Chair of IZES, Tokyo Tech.

Room B

Collaboration Room (West Bldg. 9)

B31

Renewable Energy, Energy Storage

Chair:

Prof. Takehiko Tsukahara

9:00-9:20

B31-1 Novel Seawater Desalination Technology based on Liquid Metal Fluid and Solar Thermal Energy

Toranosuke Horikawa, Masatoshi Kondo

9:20-9:40

B31-2 A Numerical Study on Carnot Battery using Chemical Heat Storage/pump and Brayton Cycle

Massimiliano Zamengo, Kazuo Yoshida, Morikawa Junko

B32

Innovative Nuclear Technology, Nuclear Data, Application

Chair:

Prof. Jun Hasegawa

9:50-10:10

B32-1 A New Detection Method of Charged-Particle Emission Reactions for the Development of Molten Sault Reactors

Tatsuya Katabuchi, Takaaki Ogiso, Hideto Nakano, Yu Kodama

10:10-10:30

B32-2 Neutron Capture Cross Section Measurement of Palladium-107 Using J-PARC

H. Nakano, T. Katabuchi, K. Terada, A. Kimura, S. Nakamura, S. Endo, G. Rovira, Y. Kodama

10:30-10:50

B32-3 Measurements of keV-Energy Neutron Capture Cross Section ²⁴³Am Using Neutron Filter

Yu Kodama, Tatsuya Katabuchi, Gerard Rovira, Hideto Nakano, Yaoki Sato, Atsushi Kimura, Shoji Nakamura, Nobuyuki Iwamoto, Shunsuke Endo, Kazushi Terada

10:50-11:10

B32-4 Conceptual design of an alpha beam accelerator system for ²¹¹At production

Daisuke Nagae, Aki Murata, Shota Ikeda, Shosuke Kikuchi, Yoichi Ma, Daigo Narita, Noriyosu Hayashizaki

- 11:10-11:30 **B32-5 Effect of Nitrogen Admixture to Underwater Argon Arc Discharge Plasma for Nuclear Decommissioning**
Hiroshi Akatsuka, Ryo Nakanishi, Atsushi Nezu, Shinsuke Mori
- 11:30-11:50 **B32-6 Ultrasonic propagation analysis of New Water Level measurement method using clamp-on ultrasonic transducers**
Takeshi Suzuki, Shuichi Omori, Hiroshige Kikura, Hideharu Takahashi

Room C, EEI Hall (North Bldg. 3)

- 10:00-11:00 **Poster Short Presentation IZES**
Chair: Prof. Masatoshi Kondo, Prof. Mikio Shimada

- 11:00-12:00 **Poster Short Presentation AESJ**

- 12:00-14:00 **Poster Session IZES (with lunch)**
Chair: Prof. Masatoshi Kondo, Prof. Mikio Shimada

- P-01 Measurement System Requirements for Photofission Signal Detection with Coincidence Neutron Counting Method**
Kim Wei Chin, Hiroshi Sagara, Jun-ichi Hori, Yoshiyuki Takahashi
- P-02 Effect of pH on water radiolysis enhanced by Zirconium oxide particles**
Yoshinobu Matsumoto, Tatsuya Suzuki, Ryuji Nagaishi
- P-03 Safeguards Approach and Design of Transuranium Fuel Cycle with Accelerator-driven System based on Material Attractiveness**
Akito Oizumi, Hiroshi Sagara
- P-04 Safety and proliferation resistance of small and medium-sized sodium-cooled fast reactors with passive shutdown devices**
Haruka Okazaki, Masatoshi Kawashima, Hiroshi Sagara
- P-05 New filter concept for removal of fine particle generated in HLLW**
Youko Takahatake, Sou Watanabe, Masayuki Watanabe, Yuichi Sano and Masayuki Takeuchi
- P-06 Once-through High Burnup Fuel Management Strategy with Dual Neutron Energy Spectrum Core in HTGR**
Hong Fatt Chong, Hiroshi Sagara
- P-07 Study on Behavior of Ablation Plasma from Liquid Metal Target for Laser Ion Source**
Kazumasa Takahashia, Naoto Harukawa, Kaoru Ishikuro, Shinya Ishikawa, Kakeru Miyazaki, Toru Sasaki, Takashi Kikuchi

- P-08** **India-Japan Civil Nuclear Cooperation: Scenario Analysis of Nuclear Energy Systems and Role of the QUAD Framework**
Saurabh Sharma, Masako Ikegami
- P-09** **Chromatographic Separation Properties of Metal Ions from Simulated High-level Liquid Waste Using Sulfur-containing Amic Acid-functionalized Silica gel**
Naoki Osawa, Tatsuya Ito, Taiga Kawamura, Hao Wu, Seong-Yun Kim
- P-10** **Fundamental Research on the Integrated Measurement Method using Laser and Ultrasound for Fuel Debris Investigation**
Yuan Chen, Naruki Shoji, Hideharu Takahashi, Hiroshige Kikura
- P-11** **Development of Gas-Liquid Two-Phase Flowmeter with Pulsed Ultrasound**
Naruki Shoji, Hideharu Takahashi, Hiroshige Kikura, Koji Teramoto, Hideki Kawai
- P-12** **Effects of chloride salts doping on high temperature CO₂ capture by molten alkali-metal borates**
Ryota Utsumi and Takuya Harada
- P-13** **Development of electrolyte in metal-supported solid oxide electrolysis cells on CO₂ electrolysis performance.**
Kosuke Umeda, Yuko Maruyama, Sho Kuzukami, Shuzo Tominaga, Tan Zhe, Yukitaka Kato, Hiroki Takasu
- P-14** **Investigation of the strain tuning methods to improve the performance of LIB's cathode materials**
Masato Torii, Takashi Kawakami, Shusuke Yamanaka, Mitsutaka Okumura
- P-15** **Material Development for Thermochemical Energy Storage Using Magnesium Chloride and Ammonia Gas-Solid Reaction System for utilization of energy**
Tetta Enosawa, Saki Yoshida, Hiroki Takasu, Yukitaka Kato
- P-16** **Development of thermochemical energy storage materials with enhanced thermal conductivities using calcium hydroxide and silicon-impregnated silicon carbide foam**
Kyosuke MOCHIZUKI, Shigehiko FUNAYAMA, Soichiro TAMANO, Takashi KATO, Massimiliano ZAMENGO, Hiroki TAKASU, Yukitaka KATO
- P-17** **Effect on electrolysis performance depending on cell layer composition of metal-supported solid oxide electrolysis cells**
Sho Kuzukami, Kosuke Umeda, Shuzo Tominaga, TAN Zhe, Hiroki Takasu and Yukitaka Kato
- P-18** **Characterization of adsorbed cesium aerosols on epoxy resin**
Daiki Fujino, Haruaki Matsuura, Isamu Sato, Shoma Okano, Kunihisa Nakajima
- P-19** **Investigation on evaporation of fission product noble metal precipitates to be used catalysis**
Naoki Tarumi, Koya Yamazaki, Asahi Nitta, Kazuma Suzuki, Isamu Sato, Haruaki Matsuura,
- P-20** **Structural analyses of insoluble residue (platinum group alloys) in high-level radioactive liquid waste to elucidate vaporization mechanism at vitrification process**
Koya Yamazaki, Koki Sakashita, Seishiro Tanaka, Naoki Tarumi, Haruaki Matsuura, Isamu Sato,

Haruka Tada

- P-21 Elucidation of adsorption mechanism of rare earth to alkyl diamidoamine adsorbents**
Kazuki Minowa, Sou Watanabe, Masahiko Nakase, Shinta Watanabe, Yasutoshi Ban,
Haruaki Matsuura
- P-22 Mo(VI), Zr(IV) and Pd(II) ion recovery mechanism onto baker's yeast from nitric acid medium**
Kenta Hasegawa, Sou Watanabe, Yoichi Arai, Masayuki Watanabe, Haruaki Matsuura,
Naoto Hagura, Yasuhiro Konishi
- P-23 Ultra-Sensitive Detection of Uranyl Ions Using Lab-on-a-Chip Surface-Enhanced Raman Spectroscopy**
Wakana Yonekura, Naokazu Idota, and Takehiko Tsukahara
- P-24 Direct Recovery of Uranyl Ions from Nuclear Wastes using Temperature-Swing Gelification Extraction Process**
Atsuki Naruse, Ki Chul Park, Naokazu Idota, and Takehiko Tsukahara
- P-25 Simulation of 10kWe Heat Pipe Reactor Battery using AMESim**
Jong-Sung Chi, Young Beom Jo, Su-San Park, Jin Hyun Kim, Eung Soo Kim
- P-26 Measurement of environmental and composite samples in the compact WDS-PIXE system**
Takaaki Matsui, Koki Ushijima, Hong-Fu Liu, Jun Kawarabayashi, Sou Watanabe, Yuko Hatano,
Naoto Hagura
- P-27 Investigation of High Energy Particle Dynamics in a Linear Inertial Electrostatic Confinement Fusion Device by Particle-in-Cell Monte Carlo Collision Method**
Kazuhiro Matsuda, Jun Hasegawa, Seita Yamashita
- P-28 Development of a Long-life Laser Ion Source Using a Cryogenic Solid Target**
Yuji Inoue, Jun Hasegawa, Naoki Matsubara, Kazumasa Takahashi, Jun Tamura,
Kazuhiko Horioka, Ken Takayama
- P-29 Radiobiological Characterization of Neutron Irradiation Field of UTR-KINKI: Cell Killing Effect and Its Enhancement by Neutron Capture Using Boronophenylalanine**
Shoji Imamichi, Yoshihisa Matsumoto, Toshiro Matsuda, Satoshi Nakamura, Mikio Shimada,
Hirokuni Yamanishi, Mitsuko Masutani, Minoru Suzuki
- P-30 Development of Passive Neutron Emission Tomography Robust to Its Various Inhibiting Factors and Its Applicability to Nuclear Safeguards**
Katsuyoshi TSUCHIYA, Hiroshi SAGARA, Chi Young HAN
- P-31 Study of proton distribution in the backing material of accelerator neutron source solid target by ERDA analytical techniques**
Hong-Fu Liu, Naoto Hagura, Tomohiro Kobayashi, Jun Kawarabayashi,
- P-32 Development status of the accelerator system for the transportable compact neutron source RANS-III**
Shota Ikeda, Yoshie Otake, Tomohiro Kobayashi, Noriyosu Hayashizaki

- P-33** **A compact X-ray source using iridium cerium thermionic cathode**
Daisuke Satoh, Hidetoshi Kato, Takeshi Fujiwara, Masahito Tanaka, Ryoichi Suzuki
- P-34** **Cooling simulation of RFQ linac with three-layer structure for high duty cycle operation**
Aki Murata
- P-35** **Stroboscopic X-ray Imaging Technique with Optically Chasing Accelerator Operation for Mechanically Driven Sample**
Tatsunori Shibuya
- P-36** **Advancing reactor power measurements using Cerenkov radiation: current status and opportunitie**
Jason Hearnea, Pavel Tsvetkova
- P-37** **Development of Highly-Efficient Analytical Process of Europium(III) using Ionic Liquid-based Micro Extraction and Thermal Lens Spectroscopy**
Aileen Brandt, Dimitrios Tsaoulidis, Panagiota Angeli, Eric S. Fraga, and Takehiko Tsukahara
- P-38** **V(V)-Cl coordinate complexation mechanism for inhibiting V-pentoxide precipitation in acid aqueous environment**
Youngho Lee, Deokhee Yun, Yunsun Kim, Daewon Chung, Joonhyeon Jeon

12:00-14:00 **AESJ Poster Session**

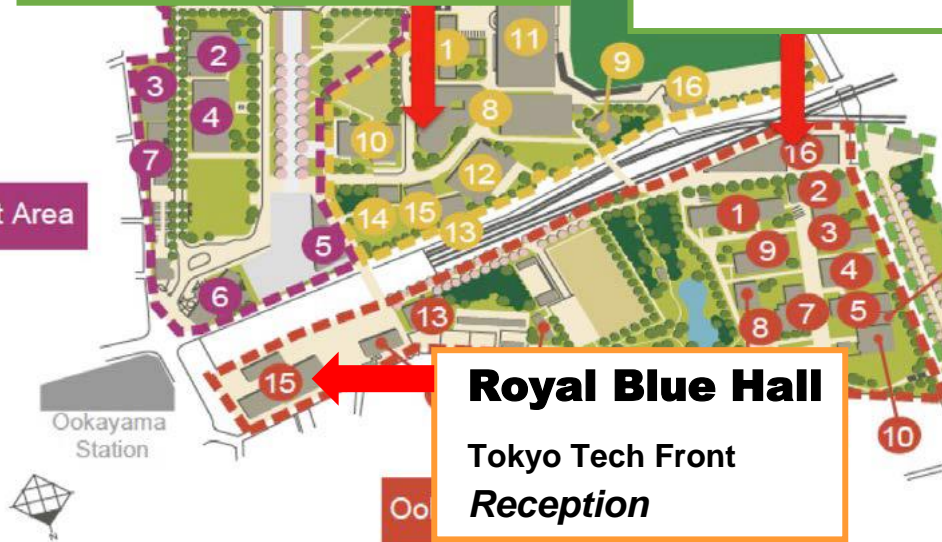
Room A,B

Multi-Purpose Digital Hall,
Collaboration Room (West Bldg. 9)
Registration, Plenary, Oral

Room C

EEl Hall(North Bldg. 3)
Oral, Poster, Lunch

Ookayama East Area



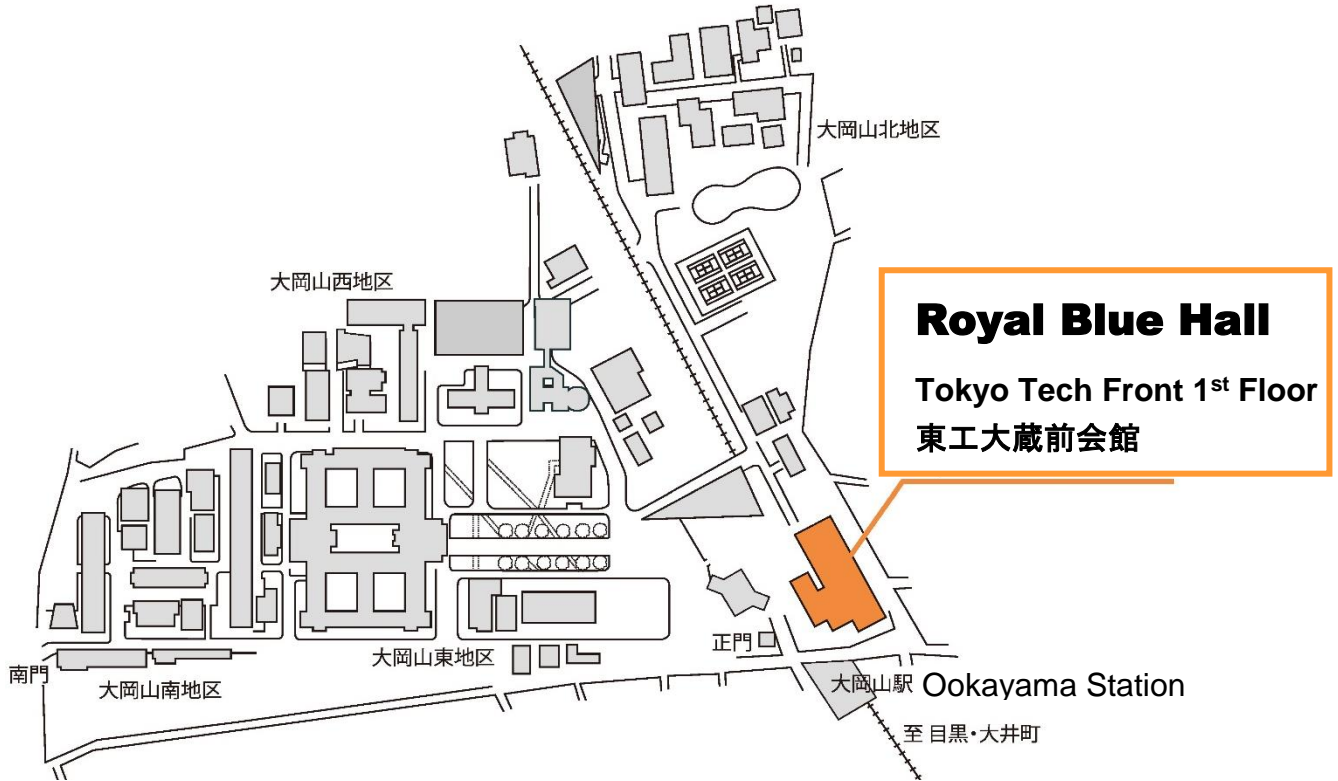
Royal Blue Hall

Tokyo Tech Front
Reception

Reception

At 18:00-20:00 on 11th January, 2023

Royal Blue Hall, Tokyo Tech Front 1st Floor



Tokyo Tech Campus Map



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

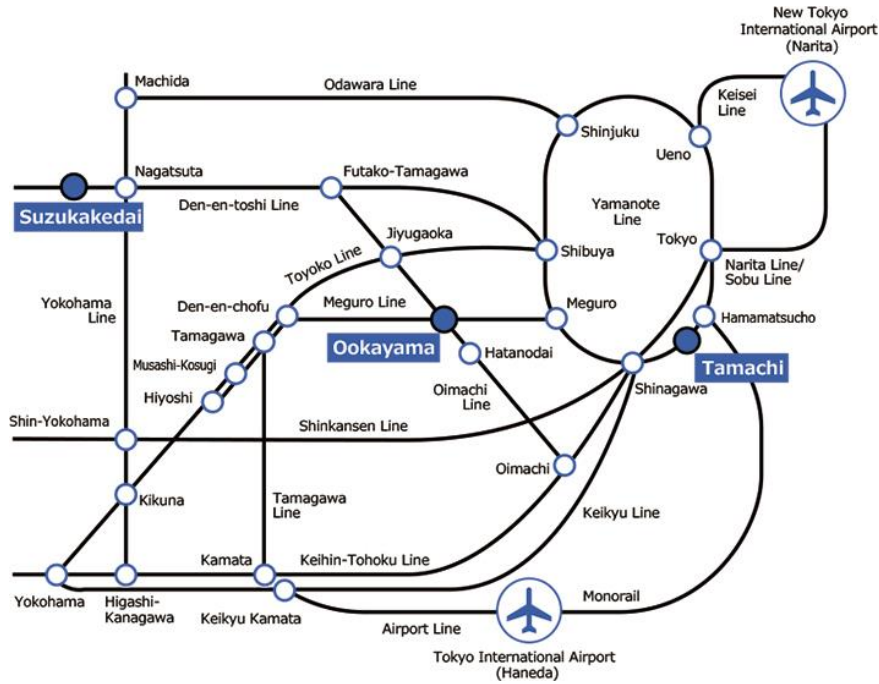
Nearest stations

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