

## Presentation Program

- (1) The total allotted time for each paper is 20minutes of which 15minutes are for presentation and remaining 5 minutes are for discussion.
- (2) In the each of multiple authors from same institution, the affiliation of the first author from each institution is mentioned. The affiliation(s) of author(s) is same as the preceding author.

-----< Monday 22 October>-----

### Room A (L0016) Monday 22

Organized Session OS-4  
Development of Innovative Stirling Refrigeration Systems  
Organizer: Noboru Kagawa (National Defence Academy),  
Takeshi Hoshino (JAXA),  
Toshio Otaka (Kokushikan Univ.)

13:00~14:40 OS-4 Chairperson: Noboru Kagawa (National Defence Academy)

- [A101](#) Study on a Small Size Stirling Refrigerator Used Active-Type Regenerator  
*Toshio Otaka (Kokushikan Univ.), Masahiro Ota (Tokyo Met. Univ.)*
- [A102](#) Field Test of Liquid Cooling System for CCD Camera using Stirling Cooler  
*Hirohisa Kurosaki (JAXA), Atsushi Nakajima, Takeshi Hoshino*
- [A103](#) Development of a Low Temperature Transportation Container "COOL CARGO FZ", SC-JS05  
*Takeshi Suzuki (Twinbird Corp.), Ryosuke Saito, Toshikatsu Nomizu*
- [A104](#) A study of the effect for living tissue by Cryosurgery-hyperthermia operation system utilizing Peltier device and Stirling refrigerator, *Daishi Takahashi (Nagaoka Univ. of Tech.), Tomoya Takahashi, Kazuya Sone (Twinbird Corp.), Ichiro Fukumoto (Nagaoka Univ. of Tech.)*
- [A105](#) Highly Efficient Free Piston Stirling Heat Pump-Direct connection with CO<sub>2</sub> Compressor,  
*Nobutoshi Tezuka (Global Cooling Japan).*

### Refrigeration Technology Experts Seminar SN-1

15:20~ 17:30 SN-1 Chairperson: Susumu Ikeda (DAPS)

- [A106](#) The Trend of the Energy Saving that Applied IT in the Field of Air Conditioning  
*Masahiro Inoue (Shibaura Institute of Technology), Yoshio Ozawa (SANYO Electric), Tetsuyuki Kondou (DAIKIN INDUSTRIES)*
- [A107](#) AIB Food Safety  
*Yoshifumi Inoue (Japan Institute of Baking)*
- [A108](#) Facilities Management in order to Ensure Food Safety  
*Keiichi Washizu (Yamazaki Baking Co., Ltd)*
- [A109](#) A World Maximum Grade Ammonia Absorption Refrigerator Delivery Example  
*Shinji Kashihara (DAIKIN APPLIED SYSTEMS)*

### Room B (L0017) Monday 22 October

Organized Session OS-3  
Absorption Refrigeration and Heat Pump Systems  
Organizer: Atsushi Tsujimori (Kanto Gakuin Univ),  
Kiyoshi Saito (Waseda Univ.)

13:00~ 14:40 OS-3 (1) Chairperson: Kiyoshi Saito (Waseda Univ.)

- [B101](#) Development of Waste Heat Recovery Heat Pump System (System that collects rejection heat and manufactures steam and warm water)  
*Tooru Ninomiya (Toyo Engineering Works), Isao Hirano, Jyun Itioka, Shinichiro Watabe*
- [B102](#) Development of Absorption Heat Pump Steam Generator  
*Keisuke Kajiyama (TOKYO GAS CO., LTD), Masahiro Oka, Yukihiro Fukusumi (EBARA CORPORATION), Kiichi Irie, Sunao Kawai (Waseda Univ.), Kiyoshi Saito*
- B103 (Canceled)
- [B104](#) Prediction for Cycle Performance of Absorption Refrigeration Cycle without Solution Pump Effect of Refrigerant Concentration  
*Kousuke Hirata (Kanto-gakuin Univ.), Atushi Tsujimori, Masashi Sonoda, Kazushige Nakao (Mitsubishi Electric Co.)*
- [B105](#) Experimental Study on Gas Engine-Driven Compression / Absorption Heat Pump System  
*Tsutomu Wakabayashi (Osaka Gas CO., LTD.), Hiroumi Fujimoto, Shingo Yakushiji, Koji Moriya*
- [B106](#) Development of a Novel Home Cogeneration System using a Polymer Electrolyte Fuel Cell which Enabled Air Conditioning by Its Low-Temperature Waste Heat Basic Characteristics of Low Temperature Waste Heat Driven Compact Refrigerator  
*Tatsuya Fukuda (Osaka City Univ.), Nobuya Nishimura, Hiroyuki Iyota, Ryuichiro Kawakami (Osaka Gas Company), Kuniaki Honda*

15:20~ 17:20 OS-3 (2) Chairperson: Masashi Kato (Mayekawa MFG.)

- [B107](#) Influence of Lithium Bromide Concentration on the Performances of a Vertical Flat Plate-type Generator and a Horizontal Tube-type Absorber  
*Ryoji Suehiro (Ehime University), Akemi Kayano, Kenji Kawasaki, Akira Matsuda, Katsumi Honda (Kyusyu University)*
- [B108](#) Visualization of LiBr Solution Flow for Falling Film Absorption Heat Transfer on Smooth and Enhanced Finned Tube  
*Hiroyuki Takahashi (Kobelco & Materials Copper Tube, LTD.), Shigeru Koyama (Kyushu Univ.)*
- [B109](#) Vapor Absorption Promotion of an Aqueous Lithium Bromide Solution by the Surfactant Quantity of Vapor Absorption and Critical Micelle Concentration  
*Daisuke Hoshino (Tokyo Metropol. Univ.), Satoru Kato, Kazuhiko Murakami, Masahiro Ota*
- [B110](#) Simulation of Heat Energy Transportation by Solution Transportation Type Absorption Cycle using Ammonia-water System  
*Satoru Matsuo (Tokyo University of Agriculture and Technology), Atushi Akisawa, Takao Kashiwagi (Tokyo Institute Technology)*

- [B111](#) A Trial to the Establishment of the General Heat System Analytical Technique The 5th Report: Apply to Dynamic Simulation about Absorption Chillers  
*Yuuki Kogure (Waseda Univ.), Kiyoshi Saito, Masahiro Oka (Tokyo Gas Co., Ltd.), Hirofumi Sasaki, Sunao Kawai (Waseda Univ.)*
- [B112](#) Development of Built in Thermal Measurement Unit for Absorption Chiller/Heater  
*Kenitirou Watanabe (Energy Advance Co. Ltd.), Yasunao Komatsu (Tokyo Gas Co. Ltd.), Masanori Ikou, Masashi Ooji, Masahiko Ooshima (Yazaki Corporation), Kousei Kawamura, Nakahiro Inagaki, Akira Yamauchi*

Room C (BASE2/3) Monday 22 October

Organized Session OS-5  
Thermophysical Properties of New Refrigerants  
Organizer: Yukihiro Higashi (Iwaki Meisei univ.),  
Masaaki Okada (Tsukuba Univ. of Tech.)

10:00~ 12:00 OS-5 (1) Chairperson: Masaaki Okada (Tsukuba Univ. of Tech.)

- [C101](#) [Keynote] Present and Future of Refrigerants  
*Noboru Kagawa (National Defence Academy)*
- [C102](#) Prediction of Vapor-Liquid Equilibrium Data of CO<sub>2</sub>/DME Mixture  
*Akio Miyara (Saga Univ.), Hasan M.M. Afroz*
- [C103](#) Vapor-Liquid Equilibrium Measurements for the CO<sub>2</sub> + R290 Mixture  
*Yukihiro Higashi (Iwaki Meisei univ.), Katsuyuki Tanaka, Ryo Akasaka (Kyushu Lutheran Univ.), Yohei Kayukawa (AIST), Kennichi Fujii*
- [C104](#) Calculation of the Critical Point for Refrigerant Mixtures using the Helmholtz Equations of State  
*Ryo Akasaka (Kyushu Lutheran College)*
- [C105](#) Mixture Virial Equation of State for R410A  
*Yohei Kayukawa (AIST), Kennichi Fujii*

13:00~ 14:00 OS-5 (2) Chairperson: Yukihiro Higashi (Iwaki Meisei univ.)

- [C106](#) Function Approximation of Specific Heat of CO<sub>2</sub> at Constant Pressure in Super-critical Region  
*Akira Okuyama (Fujitsu General Institute of Air-Conditioning Technology LTD.), Keiko Shiromoto*
- [C107](#) Characteristic of Local Heat Transfer in Forced Convective Boiling of Ammonia and Ammonia/Water Mixture on the Plate Type Evaporator  
*Akio Okamoto (Saga Univ.), Hirofumi Arima, Jeong-Hun Kim, Hirokuni Akiyama, Yasuyuki Ikegami*
- [C108](#) Transportation of Nonadecane Particles Dispersed in Water Flow  
*Hiroya Hasegawa (Chiba University), Xiang Xie, Gaku Tanaka, Makoto Hishida*

General Session GS-1  
Air-conditioning System

14:20~ 15:40 GS-1 Chairperson: Shigeki Kametani (Tokyo University of Marine Science and Technology)

- [C109](#) Theoretical Analysis on the Optimal Operation of Two Types of Chillers with Different Partial Load Performance  
*Atsushi Akisawa (Tokyo Univ. of A & T), Masato Sanbuichi, Takahiko Miyazaki, Kazumichi Araki, Takao Kashiwagi (Tokyo Institute of Technology)*
- [C110](#) Consideration of Heat Pump System with Introducing Solar Panel and Water Transpiration  
*Kenta Naito (Keio University), Rumi Okada, Haruki Sato*
- [C111](#) Evaluation of Annual Performance of Multi-Air-Conditioner for Buildings  
*Ei-ichiro Ohashi (Nagoya Univ.), Choyu Watanabe (Chubu Electric Power), Masafumi Hirota (Nagoya Univ.), Katsuaki Nagamatsu (Chubu Electric Power), Hiroshi Nakayama*
- [C112](#) Development of Simple Monitoring System and Measurement Diagnosis of Energy System  
*Akira Nakajima (Waseda University), Daiki Taguchi, Hiroshi Onoda, Katsuya Nagata*

Workshop WS-1  
Ethics of Engineer

16:00~ 17:00 WS-1 Chairperson: Masaaki Bannai (Hitachi)

- [C113](#) Ethic of Engineer Engaged in Production  
*Hiroshi Iino (Kanazawa Institute of Technology)*

Room D (L0026) Monday 22 October

Organized Session OS-10  
Utilization Technique and Freezing Phenomena of Ice, Snow, and Frost  
Organizer: Mitsuo Seki (TOYO ENGINEERING WORKS, LTD.),  
Koji Yamashita (Mitsubishi Electric Co.)

9:40~ 12:00 OS-10 (1) Chairperson: Nobuo Shimomura (Niihama N.C.T)

- [D101](#) [Keynote] Frost Formation Problem in the Development of a Hypersonic Turboramjet Engine  
*Katsuyoshi Fukiba (Japan Aerospace Exploration Agency), Tetsuya Sato, Hiroaki Kobayashi, Hidetoshi Ohkubo (Tamagawa Univ.)*
- [D102](#) Effects of Factors on Frost Layer Thickness  
*Masayuki Ueno (Tamagawa Univ.), Hidetoshi Ohkubo, Mitsuo Seki (TOYO ENGINEERING WORKS, LTD.)*
- [D103](#) Evaluation of Frost Layer Thickness under Natural Convection  
*Hiroyuki Yotsumoto (Kansai University), Isao Ishihara, Ryouzuke Matsumoto*
- [D104](#) Observations on Frost and Defrost Phenomena on the Surface with Artificial Micro Structure  
*Keisuke Shiomi (Osaka University), Kenji Yoshida, Kataoka Isao*
- [D105](#) Study of the Influence of Air Velocity about Frost Deposition in a Low Temperature Environment  
*Koji Yamashita (Mitsubishi Electric Co.), Mamoru Hamada, Hidetoshi Ohkubo (Tamagawa University)*
- [D106](#) Development of Control Techniques of Defrosting Timing of Showcase  
*Mamoru Hamada (Mitsubishi Electric), Koji Yamashita, Yoichi Anzai (Kentetsu), Toshiya Shimizu, Daisuke Yamada*

13:00~15:00 OS-10 (2) Chairperson: Koji Yamashita (Mitsubishi Electric Co.)

- [D107](#) Development of Snow-Melting System Driven by Waste Heat of Fuel Cell  
*Akira Akahira (Aomori Industrial Research Center), Seiji Kakuta, Yutaka Kasai, Yasuaki Horikawa (Idemitsu Kosan Co., Ltd.), Hitoki Takahashi, Akito Kanno, Abuliti (Aomori Industrial Research Center)*
- [D108](#) Development of the Heat Pump Type Snow Melting Machine for Small Road Heating  
*Tetsuo Yamashita (Mitsubishi Electric Co.), Seiji Inoue, Toshinobu Kondo, Hiroshi Onuma, Hiroyuki Ogawa (Hokkaido Electric Power Co.), Shinsuke Ikenaga, Naoki Morishita, Sakan Inaba*
- [D109](#) Study on Functionally Thermal Fluid using Urea-Water Mixture  
*Taku Hokamura (TOYO ENGINEERING WORKS), Hidetoshi Ohkubo (Tamagawa University), Satoshi Watanabe*
- [D110](#) Heat Transfer and Ice Making Characteristics in Continuous Ice Making process of Organic Solution in a Circular Tube  
*Akihiko Horibe (Okayama Univ.), Hideo Inaba, Naoto Haruki, Takeshi Matsubara*
- [D111](#) Study of the Function Ice Making using the Low-temperature Plasma  
*Manabu Nakagawasai (Gunma Univ.), Shigeaki Inada, Hisanobu Kawashima, Ryuta Syouji, Yoshitaka Ide, Toru Ymaguchi*
- [D112](#) Empirical Study of Snow and Ice Fire Extinguishing System with Adherent Ice  
*Kazuya Matsuo (TOYO ENGINEERING WORKS, LTD), Hiroshi Endou, Mitsuo Seki, Hideaki Obana*

Organized Session OS-2  
Adsorption and Desiccant Cooling Systems  
Organizer: Akio Kodama (Kanazawa Univ.),  
Noriyuki Kobayashi (Nagoya Univ.)

15:20~17:00 OS-2 (1) Chairperson: Yoshinori Hamamoto (Kyushu Univ.)

- [D113](#) Performance Improvement of Single-stage Adsorption Chillers by the Optimal Operation Condition  
*Akito Moriyama (Tokyo University of Agriculture and Technology), Takahiko Miyazaki, Akisawa Atsushi, Kashiwagi Takao (Tokyo Institute of Technology)*
- [D114](#) The Evaluation of the Adsorption Heat Pump Furnished Heat Exchanger with Both Performances of Evaporator and Condenser  
*Hiroyuki Tanaka (Nagoya University), Ikki Ando, Yasuki Hirota, Tadayoshi Sumiya, Noriyuki Kobayashi, Masanobu Hasatani (Aichi Institute of Technology)*
- [D115](#) Development of High Performance Heat Exchanger to Enhance the Cooling Power of Adsorption Refrigerators Improvements of the Adsorption Characteristics and Heat Transfer Performances by the Adsorbent Coated Heat-Transfer Plate  
*Kohei Osato (TUAT), Atsushi Akisawa, Takao Kashiwagi*
- [D116](#) Preparation of Noble Adsorbent by Impregnating Silica into Active Carbon for Adsorption Heat Pump  
*Toshinari Ohike (Aichi Institute of Technology), Fujio Watanabe, Niichi Hayashi, Takamitsu Ohshima, Masanobu Hasatani, Noriyuki Kobayashi (Nagoya Univ.)*
- [D117](#) Performance Investigation of Maisotsenko Cycle on the Psychrometric Chart  
*Makoto Akiyama (Tokyo Univ. of Agriculture & Technology), Takahiko Miyazaki, Isao Nikai (NIK), Atsushi Akisawa (Tokyo Univ. of Agriculture & Technology)*

Room E (BASE 1) Monday 22 October

Organized Session OS-7  
Present Status and Future Development of Heat Exchangers  
Organizer: Shigeru Koyama (Kyushu Univ.),  
Akio Miyara (Saga Univ.),  
Hideo Mori (Kyushu Univ.)

9:10~10:40 OS-7 (1) Chairperson: Hideo Mori (Kyushu Univ.)

- [E101](#) [Keynote] Natural Convective Heat Transfer of Carbon Dioxide in the Supercritical Pressure Region  
*Isao Ishihara (Kansai Univ.)*
- [E102](#) Effect of the Lubrication Oil on Cooling Heat Transfer and Pressure Drop Characteristics of Supercritical Carbon Dioxide inside a Micro-fin Tube  
*Shinya Higashiue (Kyushu Univ.), Ken Kuwahara, Satoru Yanachi, Shigeru Koyama*
- [E103](#) The Evaporating Heat Transfer Characteristics on Refrigeration Cycle of CO<sub>2</sub> in the Refrigerator Oil Mixture State  
*Masafumi Katsuta (Waseda Univ.), Kyousuke Okuma, Shinya Kishi, Naoyuki Miyachi*
- [E104](#) An Experimental Study on Void Fraction of CO<sub>2</sub> in a Horizontal Micro Fin Tube  
*Shigeru Koyama (Kyushu Univ.), Chieko Kondo (Hitachi AP), Shinya Higashiue (Kyushu Univ.), Ken Kuwahara (Kyushu Univ.)*

11:00~12:00 OS-7 (2) Chairperson: Shigeru Koyama (Kyushu Univ.)

- [E105](#) Experiment for Pressure Drop of Water-ammonia Mixtures Evaporating inside a Horizontal Spirally Grooved Tube  
*Satoru Momoki (Nagasaki Univ.), Hirofumi Arima (Saga Univ.), Yuuki Isozaki (Nagasaki Univ.), Keisuke Kitajima, Tomohiko Yamaguchi, Toru Shigechi*
- [E106](#) Experimental Heat Transfer and Pressure Drop of CO<sub>2</sub>/DME Mixture Refrigerant inside Horizontal Smooth Tube  
*Hasan M.M. Afroz (Saga Univ.), Akio Miyara, Atsushi Baba, Koutaro Tsubaki*
- [E107](#) Boiling Heat Transfer and Pressure Drop of a Refrigerant Flowing Vertically Downward in a Small Diameter Rectangular Tube  
*Kazushi Miyata (Kyushu Univ.), Hideo Mori, Katsumi Ohishi, Yoshinori Hamamoto*

Room A (L0016) Tuesday 23 October

Organized Session OS-7  
Present Status and Future Development of Heat Exchangers  
Organizer: Shigeru Koyama (Kyushu Univ.),  
Akio Miyara (Saga Univ.),  
Hideo Mori (Kyushu Univ.)

9:00~10:20 OS-7 (3) Chairperson: Akio Miyara (Saga Univ.)

- [A201](#) Two-phase Flow Distribution in T-junction  
*Ryo Hachisuka (Nagoya Univ.), Yasuhiro Mizuno (DENSO), Ryota Isobe (Nagoya Univ.), Masafumi Hirota*
- [A202](#) Two-Phase Flow Distribution in T-junction with Vertical Upward Main Pipe Comparison of R410A and Air-Water  
*Daisuke Nomura (Waseda Univ.), Manabu Watanabe (Tokyo University of Fisheries), Daisuke Itakura (Waseda Univ.) Masafumi Katsura*
- [A203](#) The Advanced Performance of Refrigeration Cycle with an Ejector for Recirculation Distribution and Evaporating Heat Transfer of Refrigerant in the Plate-type Evaporator  
*Tatsunori Man'o (Takasago Thermal Eng.), Masayuki Tanino, Takashi Okazaki (Mitsubishi Electric Co.), Shigeru Koyama (Kyushu Univ.)*
- [A204](#) The Advanced Performance of Refrigeration Cycle with an Ejector for Recirculation-The Evaporating Heat transfer in the Vapor/Liquid Re-circulated Plate-type Evaporator  
*Daigo Kittaka (Takasago Thermal Eng.), Tatsunori MAN'O, Masayuki Tanino*

10:40~12:00 OS-7 (4) Chairperson: Tatsunori Man'o (Takasago Thermal Eng.),

- [A205](#) Study on Improvement in the Compact Performance of Counter-flow Heat Exchanger  
*Kaijian Wang (Fujitsu General Institute of Air-Conditioning Technology LTD), Takao Kojima, Masaharu Fukaya, Akira Okuyama, Keiko Shiromoto*
- [A206](#) Effect of Thermal Contact Resistance on Fin-tube Heat Exchanger Performance  
*Hirokazu Fujino (Daikin AC&E Lab.), Toshimitsu Kamada, Shun Yoshioka, Kazushige Kasai (Daikin Industries)*
- [A207](#) Condensation Heat Transfer of HFC Refrigerants for Plate Type Heat Exchangers II. Evaluation of System with R410A Refrigerants  
*Takahiro Ushijima (Mitsubishi Electric Corporation), Kazuki Okada, Hirokuni Siba, Taro Hattori, Yasunori Sida*
- [A208](#) Investigation of Heat Transfer Characteristics of Oblique-wave Surface  
*Kentaro Fukuda (Tokyo Univ.), Naoki Shikazono*

13:00~14:20 OS-7 (5) Chairperson: Satoru Momoki (Nagasaki Univ.)

- [A209](#) A New Method for Measuring Cooling Capacity of Unit Coolers-Measurement Considering Latent Heat Load  
*Guang Yang (Tokyo University of Marine Science and Technology), Manabu Watanabe, Masakazu Hara (Japan Cooler Association), Toru Suzuki (Tokyo University of Marine Science and Technology)*
- [A210](#) Study of Evaluation Method of Heat Pump Water Heaters  
*Kazuaki Shikichi (The Japan Refrigeration and Air Conditioning Industry Association Residential Heat Pump Water Heaters Technological Committee)*
- [A211](#) Performance Evaluation on Water-electrolysis Fuel Cell Unitized Reversible Cell (URC) -Evaluation of fuel cell performance by mass transfer  
*Atsushi Kato (Takasago Thermal Engineering), Masao Masuda, Atsushi Takahashi, Tetsuya Yoshida (Daiki Ataka), Hiroshi Ito (AIST), Tsutomu Irooi (AIST)*
- [A212](#) Enhancement of Heat Transfer in Metal Hydride Heat-Exchanger using Copper Plate  
*Nobuo Shimomura (Niihama N.C.T)*

Organized Session OS-2  
Adsorption and Desiccant Cooling Systems  
Organizer: Akio Kodama (Kanazawa Univ.),  
Noriyuki Kobayashi (Nagoya Univ.)

14:40~15:40 OS-2 (2) Chairperson: Akihiko Horibe (Okayama Univ.)

- [A213](#) Pressure Drop and Heat and Mass Transfer in Structured Packing of Absorption-type Dehumidifier  
*Seiichi Yamaguchi (Waseda University), Kiyoshi Saito, Sunao Kawai*
- [A214](#) Performance Evaluation of Absorption-type Dehumidifier by Simulation and Experiment  
*Jun Ide (Waseda University), Seiichi Yamaguchi, Kiyoshi Saito, Sunao Kawai*
- [A215](#) Investigation of Operation/Design Concept for Achieving a High Efficiency Desiccant Cooling Process  
*Takuya Tsujiguchi (Kanazawa Univ.), Akio Kodama*
- A216 (Canceled)

Room B (L0017) Tuesday 23 October

Organized Session OS-1  
Next Generation High Performance Refrigeration Systems  
Organizer: Fumio Matsuoka (Mitsubishi Electric)

13:00~14:40 OS-1 (1) Chairperson: Fumio Matsuoka (Mitsubishi Electric)

- [B201](#) Study on COP Improvement of Room Temperature Magnetic Refrigerator  
*Yuji Mori (Tokyo Tech.), Tetsuji Okamura, Naoki Hirano (Chubu Electric Power Co. Inc.), Shigeo Nagaya*
- [B202](#) Effect of Magnetic Field Strength on Cooling Performance of Room Temperature Magnetic Refrigerator  
*Ko Nakamura (Hokkaido Univ.), Tsuyoshi Kawanami, Masahiro Ikegawa, Naoki Hirano (Chubu Electric Power Co., Inc.), Shigeo Nagaya*
- [B203](#) Development of Air-cycle Refrigeration for Containers  
*Nobuyuki Suzuki (NTN Corporation), Hiroyuki Yamada, Kenichi Suzuki, Masanori Hanawa (Earthship K.K.)*
- [B204](#) Performance Analysis on Heat Pump Cycle of CO<sub>2</sub>/DME Mixture Refrigerant  
*Youji Onaka (Saga Univ.), Akio Miyara, Koutaro Tsubaki, Koyama Shigeru (Kyushu Univ.)*
- [B205](#) Development of Traveling-Wave Thermoacoustic Refrigerator  
*Satoshi Shimokawa (Tokyo Univ. of A. & T.), Yuki Ueda, Atsushi Akisawa*

Room D (L0026) Tuesday 23 October

Workshop WS-2

Front Runner Plan for Energy Conservation and Effective Utilization of Biomass Energy

- 13:00~15:15 WS-2 Chairperson: Masaaki Bannai (Hitachi)
- [D201](#) Research and Development Status of Heat Storage Technology  
*Satoshi Hirano (Advanced Industrial Science and Technology)*
- [D202](#) Energy Network Technology-Efficient Energy Usage of Heat, Chemistry and Electricity  
*Hiroshi Yamaguchi (Advanced Industrial Science and Technology)*
- [D203](#) Biomass energy utilization for reducing GHG emissions  
*Masayuki Horio (Tokyo Univ. of A&T)*

- 16:30~17:30 Special Lecture Chairperson: Takao Kashiwagi (Tokyo Institute of Technology)
- [SL](#) Expectation to the field of refrigeration/air conditioning for the achievement of Kyoto Protocol  
*Tsutomu Sakamoto (Ministry of Land, Infrastructure and Transport Government of Japan)*

Room F (BASE Meeting Room) Tuesday 23 October : A. M.

International Session IS

- 10:00~12:00 IS Chairperson: Bidyut Saha (Kyushu Univ.)
- [F201](#) A comparative study between desorption and volumetric methods for activated carbon -methane isotherms,  
*Habib, Khairul, Saha, Bidyut, Chakraborty, Anutosh, El-Sharkawy, Ibrahim, Koyama, Shigeru (Kyushu University)*
- [F202](#) Binary Nanofluids for Absorption Performance Enhancement,  
*Yong-Tae Kang, Jung-Ha Park, Jin-Ki Lee (Kyung Hee University)*
- [F203](#) Single stage adsorption chiller employing CaCl<sub>2</sub>-in-silica gel composite sorbent - water pair,  
*Chakraborty, Anutosh, Saha, Bidyut, Koyama, Shigeru (Kyushu University), Yu, Aristov (Russian Academy of Sciences)*
- [F204](#) Capacity control of multi-type heat pump system using multi-input multi-output scheme,  
*Il Hwan Lee, Min Soo Kim (Seoul National University)*
- [F205](#) Rib Effect on the Performance of a High Temperature Generator,  
*Keumnam Cho, Insong Lee (Sungkyunkwan University)*
- [F206](#) Two-phase distribution of R-134a in a brazed aluminum heat exchanger,  
*N.-H. Kim, J.-H. Ham, D.-Y. Kim (University of Incheon)*

Room F (L0035) Tuesday 23 October : P. M.

Organized Session OS-6

Present Status and Future Development of Compressors

Organizer: Mitsuhiro Fukuta (Shizuoka Univ.),  
Kenji Tojo (Hitachi Appliances, Inc.)

- 13:00~14:00 OS-6 (1) Chairperson: Kenji Tojo (Hitachi Appliances, Inc.)
- [F207](#) (Canceled)
- [F208](#) Compressor Modeling for CO<sub>2</sub> Cycle Simulation  
*Tadashi Yanagisawa (Shizuoka Univ.), Mitsuhiro Fukuta, Takashi Muramatsu*
- [F209](#) Real-time Measurement of Oil Circulation Ratio in CO<sub>2</sub> Heat Pump Systems using Optical Methods Feasibility study for the case of immiscible oil  
*Lei Gao (Fukuoka Univ.), Yukio Matsusaka, Tomohiro Honda, Ryusuke Takigawa (CHINO corp.), Takao Shimizu*
- [F210](#) Real-time Measurement of Oil Circulation Ratio in CO<sub>2</sub> Heat Pump System using Optical Methods Verification with CO<sub>2</sub> heat pump system  
*Ryusuke Takigawa (CHINO corp.), Takao Shimizu, Tomohiro Honda Tomohiro (Fukuoka Univ.), Lei Gao, Yukio Matsusaka*

Compressor Technology Related Seminar SN-3

- 14:40~16:00 SN-3 Chairperson: Mitsuhiro Fukuta (Shizuoka Univ.),
- [F211](#) History of Reciprocating Compressor Technology for Refrigerator  
*Ikuomo Umeoka (Matsushita Refrigeration Company)*
- [F212](#) Slanted Drum-type Washer Dryer using Heat Pump Drying Method  
*Shigeharu Nakamoto (Matsushita)*
- [F213](#) Development of Packaged Air Conditioners for Cold Regions with Injection Compressor  
*Masanori Aoki (Mitsubishi Electric Corporation), Makoto Saito, Masato Yosomiya*
- [F214](#) The Trend of Rare Earth Magnets  
*Kazuo Tamura (Shin-Etsu Chemical Co. Ltd.)*

Room G (L0032) Tuesday 23 October

Organized Session OS-9

New Chilling and Refrigeration Techniques of Food and Organic Materials

Organizer: Toru Suzuki (Tokyo University of Marine Science and Technology),  
Manabu Watanabe (Tokyo University of Marine Science and Technology)

- 9:00~10:20 OS-9 (1) Chairperson: Ken-ichi Kudoh (The University of Tokyo)
- [G201](#) Relationship between pH and ATP-related Compounds in Frozen Meat of Minke Whale Caught in the Antarctic Ocean  
*Hitoshi Funahashi (Kyodo Senpaku Kaisha, Ltd.), Mitsuhiro Ogiwara, Yoshihiro Fujise (The Institute of Cetacean Research), Yuko Murata (National Research Institute of Fisheries Science), Emiko Okazaki, Hideto Fukushima (National Fisheries University), Ritsuko Wada, Yutaka Fukuda*
- [G202](#) Relationship between Thaw-rigor and Some Components of Frozen Bigeye Tuna Meat

Ritsuko Wada (National Fisheries University), Ryouichi Hanzawa (Mayekawa Mfg. Co., Ltd.), Kaname Matsumoto (Shinyo.Suisan Co.Ltd.), Emiko Okazaki (Fisheries Reserch Agency), Taku Kato (National Fisheries University), Kentarou Isshiki, Hideto Fukushima, Yutaka Fukuda

- [G203](#) Influence of NaCl on the Thawing of Frozen Tuna Meat  
Syuji Abe (Tokyo University of Marine Science and Technology), Manabu Watanabe, Toru Suzuki
- [G204](#) Effect of Thawing Rate on Denaturation of Myofibrillar Protein in Fish Frozen Meat  
Yutaka Fukuda (National Fisheries University), Ritsuko Wada, Hideto Fukushima

- 10:40~12:00 OS-9 (2) Chairperson: Yutaka Fukuda (National Fisheries University),
- [G205](#) Prediction of Quality Change during Thawing of Frozen Tuna Meat by Numerical Calculation  
Natsumi Murakami (Tokyo University of Marine Science and Technology), Manabu Watanabe, Toru Suzuki
- [G206](#) Microscale Behavior and Damage during Freezing of Food-Mechanism of Drip Exuding after freezing-thawing  
Yukio Tada (Kanazawa Univ.), Yuta Yoshida, Akira Takimoto, Hajime Onishi
- [G207](#) Oil Extraction Phenomena Caused by Liquid Nitrogen Freezing  
Yuri Takeuchi (Tokyo University of Marine Science and Technology), Toru Suzuki, Manabu Watanabe, Kiyoshi Takai
- [G208](#) New Freezing Method using Preliminary Room-temperature Drying by Microwave  
Takaharu Tsuruta (Kyushu Insti. of Tech.), Nurkholis Hamidi

#### Technical Seminar by Food Technology Division SN-2

- 13:00~14:20 SN-2 Chairperson: Kiyoshi Takai (JSRAE Scientific Adviser)
- [G209](#) Experimental inspection of the effect of magnetic field on freezing of food materials  
Toru Suzuki (Tokyo University of Marine Science and Technology)

- 14:40~16:00 OS-9 (3) Chairperson: Manabu Watanabe (Tokyo University of Marine Science and Technology)
- [G210](#) Development of Cryogenic Micro-Slicer Spectral Imaging System  
Takehiro Sugiyama (The Univ. of Tokyo), Yasuyuki Sagara, Tetsuya Araki, Ken-ichi Kudoh, Ryo Shirakashi, Gab-Soo Do (Nihon Univ.), Junichi Sugiyama (NFRJ), Mizuki Tsuta
- [G211](#) Measuring Technique of Moisture Distribution in Cooked Rice Grain  
Yousuke Imai (Nihon University), Kazuki Amiya, Rui HOSINO (Tokyo University), Gab-Soo Do (Nihon University), Bae Yeong-Hwan (Sunchon National University, Korea), Yasuyuki Sagara (Tokyo University), Hirofumi Kawanishi (Nihon University)
- [G212](#) Study of the Low Temperature Storage Method of Vegetables by Making the Water Structures using Nonpolar Gas  
Hiroko Ando (The Tokyo Univ.), Toru Suzuki (Tokyo Univ. Marine Science and Technology), Yoshinori Kawagoe (The Tokyo Univ.), Yoshio Makino, Seiti Osita
- [G213](#) Detection of Eutectic Solidification during Freezing of Electrolyte Solution by Electric Impedance Measurement  
Kenji Adachi (Kyushu Univ.), Takashi Yoshimori, Keisuke Yoshida, Satoru Uchida, Hiroshi Takamatsu

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#### Room A (BASE 2/3) Wednesday 24 October

Organized Session OS-8  
Heat and Mass Transfer with Solid-Liquid Phase Transformation  
Organizer: Koji Matsumoto (Chuo University),  
Masashi Okada (Aoyamagakuin Univ.)

- 9:00~10:40 OS-8 (1) Chairperson: Koji Matsumoto (Chuo University)
- [A301](#) [Keynote] Ice Formation Phenomena with Indirect Cooling  
Tetsuo Hirata (Shinshu Univ.)
- [A302](#) Freezing Characteristics of Molding Sand with Water by Cold Air Flow for Freeze Mold  
Akihiko Horibe (Okayama Univ.), Hideo Inaba, Naoto Haruki, Yasunori Miyagawa
- [A303](#) Study on Effects of Polymer Additives on Supercooling Phenomena of Water  
Hiroshi Takizawa (Tokyo Tech), Hiroyuki Kumano (Shinshu Univ.), Akio Saito, Seiji Okawa
- [A304](#) Control of Crystal Orientation of Ice Crystal Utilizing the Capillary  
Hirokazu Tanaka (Aoyamagakuin Univ.), Yoshikazu Teraoka, Masashi Okada
- 11:00~12:20 OS-8 (2) Chairperson: Masashi Okada (Aoyamagakuin Univ.)
- [A305](#) Study on Melting Behavior of Ice/Water Mixture  
Koji Watanabe (Tokyo Tech.), Seiji Okawa, Akio Saito, Mitsuru Kusaka (TEPCO), Tsutomu Hozumi (Tokyo Tech.)
- [A306](#) Development and Performance Evaluation of a Plate Type Salt-contained Ice Making Machine  
Kenji Yoshimura (Fukuoka Ind. Tech. Cent.), Tomoaki Akiyama (Iceman Co., Ltd), Shigeru Koyama (Kyushu Univ.)
- [A307](#) Performance of Vacuum Freezing Type Ice Producing System-Effect of Sublimation of Ice Produced in Solution  
Tatsunori Asaoka (Tokyo Institute of Technology), Akio Saito, Seiji Okawa, Naoki Izumi, Yoshihiro Uji (The Kansai Electric Power CCO., INC.)
- [A308](#) Influence of the Magnetic Field on Droplet Freezing  
Toshiaki Watanabe (National Fisheries Univ.)
- 13:20~14:40 OS-8 (3) Chairperson: Hiroyuki Kumano (Shinshu Univ.)
- [A309](#) Characteristics of Ice Formation and Melting for Latent Heat Thermal Energy Storage Cell using Resin Tube-mat  
Yoshio Hirasawa (Univ. Toyama), Akio Kosaka, Kazuyuki Kitano
- [A310](#) Numerical Analysis for Characteristics of Ice Formation and Melting for Latent Heat Thermal Energy Storage Cell using Resin Tube-mat  
Yoshio Hirasawa (Univ. Toyama), Kazuyuki Kitano, Akio Kosaka
- [A311](#) Study on Suppression of Ice Adhesion Force to Cooling Wall due to Voltage Application  
Hisayoshi Otaki (SONY), Koji Matsumoto (Chuo University)
- [A312](#) Characteristics of Phase Change Heat Transfer around Horizontal Tubes Immersed in Water  
Masayuki Jidaisho (Iwate University), Yuuki Takahashi (Fujitsu Limited), Kouichi Hirose (Iwate University)

Room B (L1321) Wednesday 24 October

Organized Session OS-2  
Adsorption and Desiccant Cooling Systems  
Organizer: Akio Kodama (Kanazawa Univ.),  
Noriyuki Kobayashi (Nagoya Univ.)

- 9:00~ 10:20 OS-2 (3) Chairperson: Masashi Ohkura (Tokyo University of Science),  
Atsushi Akisawa (Tokyo University of Agriculture and Technology)
- [B301](#) [Keynote] Comfortable Temperature and Humidity for the Human Body  
Hiroyuki Kitahara (Total System Laboratory)
- [B302](#) Quantitative Evaluation of Microbe Removal Performance for Desiccant Air-Conditioning  
Naoki Onda (Tokyo Gas), Hirohumi Sasaki
- B303 (Canceled)
- [B304](#) The Air Conditioning System which Separates from Latent Heat and the Sensible Heat which Use High Efficiency Compact Desiccant  
Shuji Ikegami (Daikin Industries, Ltd.), Nobuki Matsui, Yoshie Togano (Osaka Univ.), Yoshiyuki Shimoda
- 11:00~ 12:20 OS-2 (4) Chairperson: Akio Kodama (Kanazawa Univ.),
- [B305](#) Study on Energy Saving Air-Conditioning System using Compact Desiccant Ventilation Unit (Part16: Evaluation of Adsorption and Desorption Performance with Some Honeycomb Type Adsorbents)  
Masahiro Kondo (Tokyo University of Agriculture and Technology), Atsushi Akisawa, Masazumi Godo (Shin Nippon Air Technologies), Kunio Miura, Yutaka Watanabe, Toshihiko Ishizawa, Noriomi Okazaki, Takeshi Takatsuka
- [B306](#) Optimum Design Method to Minimize Size of Desiccant Wheel  
Seiichi Yamaguchi (Waseda University), Kiyoshi Saito, Sunao Kawai, Hirofumi Sasaki (Tokyo Gas Co., Ltd.), Naoki Onda
- [B307](#) Effect of Microwave Irradiation on Water Desorption from Honeycomb Rotor  
Mitsuhiko Kubota (Nagoya Univ.), Satoshi Yabe, Hitoki Matsuda
- [B308](#) Air Conditioning System by using the Organic Sorbent Desiccant Rotor and Compression Refrigerating Machine  
Akihiko Horibe (Okayama Univ.), Sadao Takagi, Hideo Inaba, Naoto Haruki, Kei Nagai
- 13:20~ 14:20 OS-2 (5) Chairperson: Noriyuki Kobayashi (Nagoya Univ.)
- [B309](#) Study on Energy Saving Air-Conditioning System using Compact Desiccant Ventilation Units (Part 15: Experimental Study on Practical Desiccant Process)  
Yutaka Watanabe (Shin Nippon Air Technologies), Kunio Miura, Toshihiko Ishizawa, Masazumi Godo, Takeshi Takatsuka
- [B310](#) Study on Energy Saving Air-conditioning System using Compact Desiccant Ventilation Units (Part 18: Thermal Characteristics of batch type heat-regenerator by simulation)  
Takeshi Takatsuka (Shin Nippon Air Technologies), Kouichi Hirose (Iwate Univ.), Yutaka Watanabe (Shin Nippon Air Technologies), Toshihiko Ishizawa, Masazumi Godo, Kunio Miura
- [B311](#) Influence of Change of Solar Irradiation and Cooling Load on the Performance of Solar Assisted Desiccant Cooling System  
Masashi Ohkura (Tokyo University of Science), Akio Kodama (Kanazawa Univ.), Shunsuke Mori (Tokyo University of Science)

General Session GS-2  
Refrigeration System

- 14:40~ 16:00 GS-2 Chairperson: Norio Sawada (SANYO)
- [B312](#) Thermal Fluid Flow Analysis of Air Curtain in a Flat Type Refrigerator Showcase  
Yuuichi Minamiyama (GAC-corp), Shouichiro Iio (Shinshu University), Masato Yoshino, Toshihiko Ikeda
- [B313](#) Development of a Low Environmental Load Direct Driven Refrigeration Unit for Transportation  
Takashi Tanaka (Mitsubishi Heavy Industries, Ltd.), Mitsutoshi Sudoh, Masakazu Kai, Kazumi Osada, Yasushi Watanabe
- [B314](#) A Study on Energy-saving in Vending Machine Operation  
Ryota Tsubouchi (Waseda Univ.), Isao Hasegawa, Hiroshi Onoda, Katsuya Nagata
- [B315](#) Flow boiling heat transfer characteristics of propane in horizontal smooth microchannel, Choi, Kwang-II, Ardiyansyah, Ardiyansyah, Oh, Jong-Taek (Chonnam National University), Oh, Hoo-Kyu (Pukyong National University)

Room E (BASE 1) Wednesday 24 October

Organized Session OS-1  
Next Generation High Performance Refrigeration Systems  
Organizer: Fumio Matsuoka (Mitsubishi Electric)

- 9:00~ 10:00 OS-1 (2) Chairperson Hiroo Nakamura (Waseda Univ.)
- [E301](#) Fine Particle and Bacteria Collection System by Negative Ions and Ozone with Mist Formation  
Akira Takimoto (Kanazawa Univ.), Yukio Tada, Hajime Onishi, Kazuyoshi Nagaura
- E302 (Canceled)
- E303 (Canceled)
- [E304](#) Performance Analysis of Rotary Dehumidifier/Humidifier and Systems 4th Report: The experimental results of dehumidification and the performance evaluation method  
Yoshinori Hamamoto (Kyushu Univ.), Hideo Mori, Fumio Matsuoka (MELCO)
- [E305](#) System Efficiency Analysis of a CO<sub>2</sub> Heat Pump Water Heater by Numerical Simulation using Thermal Network Models  
Tsuneo Imagawa (Matsushita Electric Industrial Co., Ltd.), Teruo Yamamoto, Koji Murozono, Toshimoto Kajitani, Shigeaki Matsubayashi

Organized Session OS-9  
New Chilling and Refrigeration Techniques of Food and Organic Materials  
Organizer: Toru Suzuki (Tokyo University of Marine Science and Technology),  
Manabu Watanabe (Tokyo University of Marine Science and Technology)

- 11:00~12:20 OS-9 (4) Chairperson: Takaharu Tsuruta (Kyushu Insti. of Tech.)
- [E306](#) Development of the New Micromanipulation System for Frozen Organisms (2nd report Development of the micro drilling system)  
*Jun Ninomiya (The University of Tokyo), Ryuichi Sugimoto, Ken-ichi Kudoh, Toshiro Higuchi*
- [E307](#) Relationship of Ice Crystal's Growth Rate and Grain Boundary's Area in One Dimension Freeze-concentration  
*Atsushi Watanabe (Tokyo University of Marine Science and Technology), Toru Suzuki, Manabu Watanabe, Osato Miyawaki (Ishikawa Prefectural University)*
- [E308](#) Influence of Stabilizers on the Shape of Ice Crystal Generated in Ice Cream Mix  
*Xin Wang (Tokyo University of Marine Science and Tech.), Toru Suzuki, Manabu Watanabe*
- [E309](#) Factors Affecting Freeze-Preservation Process of Lactobacillus Bulgaricus  
*Tomoe Nakamura (Tokyo University of Marine Science and Technology), Toru Suzuki, Manabu Watanabe*

Organized Session OS-6  
Present Status and Future Development of Compressors  
Organizer: Mitsuhiro Fukuta (Shizuoka Univ.),  
Kenji Tojo (Hitachi Appliances, Inc.)

- 13:20~14:20 OS-6 (2) Chairperson: Takahide Itoh (Mitsubishi Heavy Industries, Ltd.)
- [E310](#) Development of PVE Refrigeration Lubricant for Energy Saving  
*Takeo Tokiai (Idemitsu Kosan Co., Ltd.), Masato Kaneko*
- [E311](#) Measurement of Lubrication Conditions between Swashplate and Shoe in the Swashplate Compressor under Actual Operating Conditions  
*Hisashi Suzuki (Sanden Corporation), Fumikazu Nagaoka (Shizuoka University), Mitsuhiro Fukuta, Tadashi Yanagisawa*
- [E312](#) An Optimal Performance Design on Lubrication Mechanism at Thrust Slide-Bearing of Scroll Compressors  
*Tatsuya Oku (Mayekawa MFG.), Noriaki Ishii (OECU), Keiko Anami (AIT), Kiyoshi Sawai (Panasonic), Noboru Iida, Takashi Morimoto, Shota Ueda (OECU)*
- 14:40~15:40 OS-6 (3) Chairperson: Matsuo Koichi (Mayekawa MFG.)
- [E313](#) Development of Single Screw Compressor using New Tooth Profile  
*Takanori Muroto (DAIKIN)*
- [E314](#) Efficiency Simulation of High-Pressure Type Scroll Compressors for Ammonia Refrigerate  
*Noriaki Ishii (OECU), Tatsuya Oku (Mayekawa MFG.), Keiko Anami (AIT), Shota Ueda (OECU), Shohei Uchida (OECU), Akira Matsui (Mayekawa MFG.)*
- [E315](#) Development of Environment-friendly Scroll Compressor for Truck Refrigerator  
*Makoto Fujitani (Mitsubishi Heavy Industries, Ltd.), Hiroyuki Kobayashi, Hisao Mizuno, Takahide Itoh, Yasuharu Maruiwa, Toshiyuki Shikanai (Churyo Engineering Co., Ltd.), Takashi Gotoh, Shinya Matsuoka*

Room H (L0111) Wednesday 24 October

Workshop WS-3  
Overview of CO<sub>2</sub> Emission Trading  
-Trends of Policies and Business-

- 10:00~12:00 WS-3 Chairperson: Kazumichi Ito (Mitsubishi Research Institute Inc.)
- [H301](#) [Keynote] Policy Making for Global Warming Issue  
*Hideomi Nakamura (Mitsubishi Research Institute Inc.)*
- [H302](#) Overview of a New Post-Kyoto Framework and CDM/JI  
*Hiroyasu Sugihara (Development Bank of Japan)*
- [H303](#) Emission Trading in Western Countries  
*Satoshi Hashimoto (Mitsubishi Research Institute Inc.)*
- [H304](#) GHG policy in Japan (Energy Conservation Law Reforming)  
*Akihiro Shimizu (Mitsubishi Research Institute Inc.)*
- [H305](#) Emission Trading Business  
*Kazumichi Ito (Mitsubishi Research Institute Inc.)*

Open Seminar  
The Role of Refrigeration for the Freshness of Agricultural Products in Distribution System

- 14:00~16:30 Chairperson: Atsushi Akisawa (Tokyo University of Agriculture and Technology)
- [Lecture 1](#) Storage and Freshness keeping of Rice  
*Kengo Watanabe (Tokyo Univ. of A&T)*
- [Lecture 2](#) Fruit Quality and Postharvest Technology of Strawberry  
*Isao Ogiwara (Tokyo Univ. of A&T)*
- [Lecture 3](#) Traceability Management in Food Chain  
*Sakae Shibusawa (Tokyo Univ. of A&T)*