

Plenary Lecture

Room A

AMS2016 11th Asian Microgravity Symposium, Hokkaido University October 25 to 29, 2016

26 Oct. [9:00-12:00]

8:50-9:00 **Openig Remarks**

9:00-9:20 26PI-1 Chair: Osamu Fujita

Unified Scientific Program of Space Environment Utilization and Human Planetary Habitation

Masamichi Ishikawa (*The Japan Association of Microgravity Association, RIKEN, Japan*)

9:20-9:50 26PI-2 Chair: Akira Higashibata

Overview of Utilization of ISS/"Kibo" in Japan, Present Status and the Future

Masahiro Takayanagi (*Human Spaceflight Technology Directorate, Japan Aerospace Exploration Agency, Japan*)

9:50-10:20 26PI-3 Chair: Qiu-Sheng Liu

Physical and Life Science Mission of TG-2 and CSS

Yi-dong Gu (*Center for Space Utilization, Chinese Academy of Sciences, China*)

10:20-10:50 26PI-4 Chair: Masamichi Ishikawa

Current Status of Space Environment Utilization Research in Korea

Joohee Lee (*KARI, Korea*)

11:00-11:30 26PI-5 Chair: Takehiko Ishikawa

Perspectives for Cooperation with the ESA Programme of Science in the Space Environment

Olivier Minister (*European Space Agency, Netherlands*)

11:30-12:00 26PI-6 Chair: Wen-Kui Wang

Prospects of Chinese Materials Sciences in Space

Pan Mingxiang (*Institute of Physics, Chinese Academy of Sciences, China*)

27 Oct. [9:15-10:45]

8:45-9:15 27PI-1 Chair: Masamichi Ishikawa

Arc Production of Carbon Nano-Materials and Behavior of Fine Particles under Micro-Gravity Condition

Tetsu Mieno (*Graduate School of Science & Technology, Shizuoka University, Japan*)

9:15-9:45 27PI-2 Chair: Takayuki Hoson

Possible Mechanisms for Gravity Sensing in Single Cells

Masahiro Sokabe^{1*}, Takeshi Kobayashi² (*1 Mechanobiology Laboratory, Nagoya University Graduate School of Medicine, Japan, 2 Department of Integrative Physiology, Nagoya University Graduate School of Medicine, Japan*)

9:45-10:15 27PI-3 Chair: Masahito Watanabe

Measurements of Soret Coefficient in ISS Mission "Soret-Facet"

Shinsuke Suzuki (*Waseda University, Japan*)

10:15-10:45 27PI-4 Chair: Atsushi Higashitani

Hypometabolism Induced by a Natural Derivative of Thyroid Hormone, 3-Iodothyronamine: Potential Application for Space Medicine

Hyunwoo Ju, Inho Choi* (*Division of Biological Science and Technology, Yonsei University, Republic of Korea, Korea*)

28 Oct. [8:45-10:45]

8:45-9:15 28PI-1 Chair: Hiroshi Nomura

Prediction of Flammability Limits of Solid Materials in Microgravity Environments - Scale Analysis for the FLARE Project -

Shuhei Takahashi (*Gifu University, Japan*)

9:15-9:45 28PI-2 Chair: Hideyuki Takahashi

The Latest Experiments of ISS Space Utilization in Japan

Makoto Asashima (*Vice President, Tokyo University of Science, Japan*)

9:45-10:15 28PI-3 Chair: Masahito Watanabe

Crystallization and Structural Study of Highly Supersaturated Solutions

Geun Woo Lee (*Korea Research Institute of Standards and Science, Korea*)

10:15-10:45 28PI-4 Chair: Atsuko Sehara

Pre-launch Experimental Study of Bone Cell in the Mission of Chinese TZ-1 Cargo Spacecraft

Zhouqi Yang, Li Xie, Yi Lv, Tingting Li, Peng Shang* (*Key laboratory for Space Biosciences and Biotechnology, Institute of Special Environmental Biophysics, School of Life Sciences, Northwestern Polytechnical University, China*)

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Room C [12:00-13:00]

Luncheon Seminar Chair: Takeshi Nikawa

12:00-13:00 26Lu-1

Gravity-Regulated/Influenced Growth Responses in Plants: Gravitropism vs. Hydrotropism

Hideyuki Takahashi* (*Graduate School of Life Sciences, Tohoku University, Japan*)

Room A [13:00-14:15]

Space Life Science I Chair: Takeshi Kobayashi, Peng Shang

13:00-13:15 26SLi-1

Prevention of Muscle Atrophy under Microgravity through an Activation of IGF-1 Signaling Pathway

Katsuya Hirasaka^{1*}, Akinori Yamada¹, Takayuki Uchida², Shigeto Taniyama¹, Katsuyasu Tachibana¹, Akira Higashibata³, Takeshi Nikawa² (*1 Graduate School of Fisheries and Environmental sciences, Nagasaki University, Japan, 2 Department of Nutritional Physiology, Institute of Health Biosciences, University of Tokushima, Tokushima, Japan, 3 Japan Aerospace Exploration Agency (JAXA), Japan*)

13:15-13:30 26SLi-2

Microgravity-Induced Signal Transduction in Skeletal Muscle Cells

Takayuki Uchida^{1*}, Tomoki Abe¹, Ayako Maita¹, Reiko Nakao², Katsuya Hirasaka³, Atsushi Higashitani⁴, Takeshi Kobayashi⁵, Masahiro Sokabe⁵, Akira Higashibata⁶, Takeshi Nikawa¹ (*1 Department of Nutritional Physiology, Institute of Health Biosciences, The University of Tokushima Graduate School, Japan, 2 National Institute of Advanced Industrial Science and Technology, Japan, 3 Graduate School of Fisheries Science and Environmental Studies, Nagasaki University, Japan, 4 Graduate School of Life Sciences, Department of Environmental Life Sciences, Tohoku University, Japan, 5 Department of Physiology, Nagoya University Graduate School of Medicine, Japan, 6 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency (JAXA), Japan*)

13:30-13:45 26SLi-3

Mechanism on Anti-Osteoporosis of 3-Hydroxybutyrate and Derivative under Simulated Microgravity

Qian Cao^{1,2*}, Juanyu Zhang¹, Guo-Qiang Chen¹ (*1 School of Life Sciences, Tsinghua University, China, 2 Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China*)

13:45-14:00 26SLi-4

Live Micrograph Technique of the Mouse Embryos Culture Box and the Cells Reactor in a Recoverable Satellite of China (SJ-10)

Weibo Zheng*, Tao Zhang, Yin Zhang, Hao Sun, Xinglong Zheng (*Shanghai Institute of Technical Physics, CAS, China*)

14:00-14:15 26SLi-5

Loss of Rigidity Sensing of Mesenchymal Stem Cells under Microgravity

Takeshi Kobayashi^{1*}, Mizuna Tanaka¹, Toko Hashizume², Akira Higashibata³, Sachiko Yano³, Takeshi Nikawa⁴, Masahiro Sokabe⁵ (*1 Department of Physiology, Nagoya University Graduate School of Medicine, Japan, 2 AES, Japan, 3 JAXA, Japan, 4 Institute of Health Biosciences, University of Tokushima Graduate School, Japan, 5 Mechanobiology Lab, Nagoya University Graduate School of Medicine, Japan*)

Room A [14 : 25-15:30]

Space Medicine Chair: Takeshi Nikawa, Inho Choi

14:25-14:45 26SMe-1K

Electrically Stimulated Antagonist Muscle Contraction Increased Muscle Mass and Bone Mineral Density of One Astronaut - Initial Verification on the International Space Station

Naoto Shiba^{1*}, Hiroo Matuse¹, Masayuki Omoto¹, Ryuuki Hashida¹, Masafumi Bekki¹, Hiroshi Ohshima² (*1 Orthopedic Department and Division of Rehabilitation, Kurume University School of Medicine, Japan, 2 Space Biomedical Research Group, Japan Aerospace Exploration Agency, Japan,*)

14:45-15:00 26SMe-2

Effect of Dietary Soy Protein on Unloading-Mediated Muscle Atrophy

Takeshi Nikawa^{1*}, Rie Hashimoto¹, Katsuya Hirasaka², Chiaki Yano¹, Kana Aibara¹, Takayuki Uchida¹, Tomoki Abe¹, Ayako Ohno (Maita)¹, Kazuhito Akama³ (*1 Department of Nutritional Physiology, Tokushima University Graduate School, Japan, 2 Graduate school of Fisheries Science and Environmental Studies, Nagasaki University, Japan, 3 Faculty of Life and Environmental Science, Shimane University, Japan*)

15:00-15:15 26SMe-3

Studies on the Cardiovascular System and Its Regulations under Real and Simulated Microgravity Conditions in Space and Ground-Based Experiment

Masao Yamasaki^{1*}, Shimizu Tsuyoshi², Shin-ichiro Katsuda³, Hidefumi Waki⁴, Hironobu Nishimura⁵ (*1 Department of Physiology, Graduate and Undergraduate Sch. of Health Sci., Fujita Health Univ., Japan, 2 Shimizu Institute of Space Physiology, Suwa Maternity Clinic, Japan, 3 Department of Cellular and Integrated Physiology, Sch. of Medicine, Fukushima Medical Univ., Japan, 4 Department of Physiology, Graduate Sch. and Faculty of Health and Sports Sci., Juntendo Univ., Japan, 5 Doctoral Course Student, Department of Physiology, Graduate Sch. of Health Sci., Fujita Health Univ., Japan*)

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15:15-15:30 26SMc-4

Study on the Experimental Device of Bone Marrow Stem Cell Differentiation in SJ-10 Satellite

An Junshe^{1*}, Wang Yanqiu¹, Jiang Yuanda¹, Xue Changbin¹, Wang Jinfu², Zhang Cui², Wang Xiaoqing¹, Geng Baoming¹, YuQiang¹ (1 *Ational Space Science Center, Chinese Academy of Sciences, China*, 2 *Zhejiang University, China*)

Room A [15:40-16:50]

Artificial Gravity & Human Research

Chair: Satoshi Iwase

15:40-16:00 26AG-1K

Effect of Artificial Gravity with Exercise on Spaceflight Deconditioning in Humans.

Satoshi Iwase^{1*}, Naoki Nishimura¹, Kunihiro Tanaka², Tadaaki Mano² (1 *Department of Physiology, Aichi Medical University*, 2 *Gifu University of Medical Science, Nagamine, Japan*)

16:00-16:15 26AG-2

The Changes of Cognitive Function under Simulated Long-Duration Spaceflight Environment and the Effects of Dammarane Saponin on It

Yongzhi Li^{*}, Xiaorui Wu, Yingxian Li (State Key Laboratory of Space Medicine Fundamentals and Application, China Astronaut Research and Training Center, China)

16:15-16:35 26AG-3K

Influence of Galvanic Vestibular Stimulation on Spatial Reorientation

Kyu-Sung Kim^{1,2,4*}, Young Hyo Kim^{1,2}, Hyun-Ji Kim¹, Sangmin Lee^{2,3,4} (1 *Department of Otorhinolaryngology-Head & Neck Surgery College of Medicine Inha University, Korea*, 2 *Aerospace Medicine Research Group Research Institute of Medical Science Inha University, Korea*, 3 *Department of Electronic Engineering Inha University, Korea*, 4 *Institute for Information and Electronics Research (IIER), Inha University, Korea*)

16:35-16:50 26AG-4

Fluid Shift Induced by Artificial Gravity...Changes in Body Fluid Distribution during Artificial Gravity and -6° Head-Down Bed Rest using a Segment Bioelectrical Impedance Analysis

Naoki Nishimura^{1*}, Satoshi Iwase¹, Yoshihisa Masuo¹, Kunihiro Tanaka², Tadaaki Mano² (1 *Aichi Medical University, Japan*, 2 *Gifu University of Medical Science, Japan*)

Room B [13:00-14:35]

Combustion and Chemical Physics I

Chair: Osamu Imamura

13:00-13:20 26Com-1K

Overview and Current Status of the FLARE Project to Investigate Material Flammability in Microgravity

Masao Kikuchi^{1*}, Aki Hosogai¹, Masaki Nokura¹, Takuma Suzuki¹, Masato Katsuta¹, Hideki Saruwatari¹, Yasuhiro Nakamura¹, Osamu Fujita² (1 *JEM Utilization Center, Japan Aerospace Exploration Agency*, 2 *Division of Mechanical and Space Engineering, Hokkaido University*)

13:20-13:35 26Com-2

Reduced Gravity Experiments on Laser Breakdown Ignition for MMA-Air and DME-Air Mixtures by Parabolic Flights

Yoshinari Kobayashi¹, Shion Ando², Ryosuke Kinoshita³, Shinji Nakaya⁴, Mitsuhiro Tsue^{5*} (Department of Aeronautics and Astronautics, Graduate School of Engineering, University of Tokyo, Japan)

13:35-13:50 26Com-3

Flame Spread Over PMMA Cylinders in Microgravity Low Velocity Flows with Variable Oxygen Concentration

Shmuel Link¹, Xinyan Huang¹, Carlos Fernandez-Pello^{1*}, Sandra Olson², Paul Ferkul² (1 *University of California Berkeley, Department of Mechanical Engineering, USA*, 2 *NASA Glenn Research Center, Cleveland, USA*)

13:50-14:05 26Com-4

Limiting Oxygen Concentration of Flame Resistant Material in Microgravity Environment

Keisuke Maruta^{*}, Kandai Tsuboi, Shuhei Takahashi (Department of Mechanical Engineering, Gifu University, Japan)

14:05-14:20 26Com-5

Effect of Sample Thickness on Extinction of Candle-Like Burning Specimen

Yuji Nakamura^{1*}, Kazunari Hamaue¹, Aki Hosogai² (1 *Toyohashi University of Technology, Japan*, 2 *Japan Aerospace Exploration Agency, Japan*)

14:20-14:35 26Com-6

Thermal Interaction between Fuel Droplets and a Flame in Flame-Spread Phenomenon along a Fuel Droplet Array

Yusuke Suganuma^{*}, Hiroshi Nomura, Ujiie Yasushige (College of Industrial Technology, Nihon University, Japan)

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Room A [11:00-12:00]

Space Radiation Chair: Akihisa Takahashi, Yeqing Sun

11:00-11:15 27SRa-1

Biological Influence of Space Radiation under Microgravity Environment: Important Aspects and Future Approaches

Fumio Yatagai^{1,2*}, Masamitsu Honma^{1,3}, Naoshi Dohmae², Noriaki Ishioka^{1,4} (1 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 2 RIKEN Center for Sustainable Resource Science, Japan, 3 Division of Genetics and Mutagenesis, National Institute of Health Sciences, Japan, 4 The Graduate Univ. of Advanced Studies, Japan)

11:15-11:30 27SRa-2

Development of 3D-Clinostat Synchronized Heavy-Ion Irradiation System

Hiroko Ikeda^{1*}, Jun Hidema², Takeshi Nikawa³, Yukari Yoshida¹, Hikaru Souda¹, Tatsuki Kanai¹ (1 Gunma University Heavy Ion Medical Center, Japan, 2 Tohoku University, Japan, 3 Tokushima University, Japan)

11:30-11:45 27SRa-3

Possible Synergistic Biological Effects of Space Radiation and Microgravity on the MicroRNA and mRNA Expression Profiling of *Caenorhabditis Elegans* during the Shenzhou-8 Mission

Yeqing Sun*, Ying Gao, Lei Zhao (1 Institute of Environmental Systems Biology, Dalian Maritime University, China)

11:45-12:00 27SRa-4

Mining Potential Biomarkers in *Caenorhabditis Elegans* Experienced Shenzhou-8 Spaceflight with Multiple Feature Selection Techniques

Lei Zhao^{1*}, Dong Mi², Yeqing Sun¹ (1 Institute of Environmental Systems Biology, Dalian Maritime University, PR China, 2 Department of Physics, Dalian Maritime University, China)

Room A [13:00-14:30]

Space Life Science II Chair: Atsushi Higashitani, Junsoo Park

13:00-13:15 27SLi-1

Neuromuscular Signaling via TGF- β /DBL-1 Acts to Alter Body Physique in Response to Environmental Conditions

Shunsuke Harada¹, Toko Hashizume², Kanako Nemoto¹, Zhenhua Shao¹, Nahoko Higashitani¹, Timothy Etheridge³, Nathaniel J Szewczyk⁴, Keiji Fukui⁵, Akira Higashibata⁶, Atsushi Higashitani^{1*} (1 Graduate School of Life Sciences, Tohoku University, Japan, 2 Advanced Engineering Services, Japan, 3 College of Life and Environmental Sciences, University of Exeter, UK, 4 Royal Derby Hospital, University of Nottingham, UK, 5 Japan Space Forum, Japan, 6 Human Spaceflight Technology Directorate, Japan Aerospace Exploration Agency, Japan)

13:15-13:30 27SLi-2

CPP30 Interferes with Oxidative Stress-Induced C2C12 Myoblast Cell Death through Inhibition of Autophagic Flux

Hyunju Kim, Junsoo Park* (Division of Biological Sciences, Yonsei University, Korea)

13:30-13:45 27SLi-3

Hypergravity Alters Motor Neuron Development in *C. Elegans*

Saraswathi Kalichamy, Tong Young Lee, Jin Lee* (Division of Biological Science and Technology, Yonsei University, Korea)

13:45-14:00 27SLi-4

Research on Experimental Device for Combined Effects of Space Radiation and Microgravity on Mammalian Cells and Fruit Flies in SJ-10 Satellite

Wang Yanqiu^{1*}, Xue Changbin¹, Jiang Yuanda¹, Geng Baoming¹, Hang Haiying², Yu Qiang¹ (1 National Space Science Center, Chinese Academy of Sciences, China, 2 Institute of Biophysics, Chinese Academy of Sciences, China)

14:00-14:15 27SLi-5

The Effect of Hindlimb Suspension on the Skeletal Muscle and Expression of mTOR in a Rat Model

Hana Lee^{1*}, Seohyun Kim¹, Donghyun Hwang¹, Yeong-Min Yoo¹, Dong-Hyun Seo¹, Seungkwan Cho², Han Sung Kim¹ (1 Department of Biomedical engineering, Yonsei University, Republic of Korea, 2 Medical Device Lab, Yonsei-Fraunhofer IZFP, Republic of Korea, Korea)

14:15-14:30 27SLi-6

Microgravity Crystallization of Thermostable L2 Lipase

Fairolniza Mohd Shariff^{1*}, Raja Noor Zaliha Raja Abd Rahman¹, Mahiran Basri³, Abu Bakar Salleh² (1 Department of Microbiology, 2 Department of Biochemistry, Faculty of Biotechnology and Biomolecular Sciences, 3 Department of Chemistry, Faculty of Science Universiti Putra Malaysia, Malaysia)

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Room A [14:45-16:20]

Space Plant I Chair: Kouichi Soga, Wei-Ming Cai

14:45-15:05 27SPI-1K

Increase in the Cytoplasmic Free Calcium Ion Concentration in Response to Changes in the Gravity Vector in Arabidopsis Seedlings

Hitoshi Tatsumi^{1*}, Masataka Nakano^{2,3}, Masatsugu Toyota^{4,5}, Hidetoshi Iida², Masahiro Sokabe⁶, Takuya Furuichi⁷

(1 Department of Applied Bioscience, Kanazawa Institute of Technology (KIT) Japan, 2 Department of Biology, Tokyo Gakugei University, Japan, 3 Research Institute for Science and Technology, Tokyo University of Science, Japan, 4 Department of Botany, University of Wisconsin, USA, 5 Precursory Research for Embryonic Science and Technology (PRESTO), Japan Science and Technology Agency (JST), Japan, 6 Mechano-biology Laboratory, Nagoya University Graduate School of Medicine, Japan, 7 Department of Human Life Sciences, Nagoya University of Economics, Japan)

15:05-15:20 27SPI-2

Gene Expression Profile of Arabidopsis under High Magneto-Gravitational Environment

Yi Lu*, Peng Shang (School of Life Sciences, Northwestern Polytechnical University, China)

15:20-15:35 27SPI-3

Effect of Simulated Microgravity on Plant Growth Performance of MR 219 Rice Seed

Teoh Chin Chuang^{1*}, Nor Syahidah Binti MD Sam², Ong Keat Khim³, Norliza Tendot Binti Abu Bakar⁴ (1 Malaysian Agricultural Research and Development Institute, Malaysia, 2 National Defense University of Malaysia, Malaysia)

15:35-15:50 27SPI-4

Effects of Microgravity on the Development of Supporting Tissues in the Peduncle of Arabidopsis

Ichirou Karahara^{1*}, Masaki Muramoto¹, Shunya Sujishi², Daisuke Tamaoki¹, Sachiko Yano³, Fumiaki Tanigaki³, Toru Shimazu⁴, Haruo Kasahara⁵, Hirokazu Kasahara⁶, Daisuke Yamauchi⁷, Kentaro Uesugi⁸, Makoto Hoshino⁸, Akihisa Takeuchi⁸, Yoshio Suzuki⁸, Yoshinobu (1 Department of Biology, Graduate School of Science and Engineering, University of Toyama, Japan, 2 Faculty of Science, University of Toyama, Japan, 3 Japan Aerospace Exploration Agency, Japan, 4 Japan Space Forum, Japan, 5 Japan Manned Space Systems Corporation, Japan, 6 School of Biological Sciences, Tokai University, Japan, 7 Department of Life Science, Graduate School of Life Science, University of Hyogo, Japan, 8 Japan Synchrotron Radiation Research Institute, Japan)

15:50-16:05 27SPI-5

The Resist Tubule Experiment onboard the Kibo: Growth of Arabidopsis Tubulin Mutants and Reorientation of Cortical Microtubules under Microgravity Conditions

Takayuki Hoson^{1*}, Mana Murakami¹, Shiho Kato¹, Yusuke Tanimura¹, Atsushi Mabuchi¹, Kouichi Soga¹, Kazuyuki Wakabayashi¹, Hirofumi Hashimoto², Masamichi Yamashita², Katsuya Hasegawa², Akira Higashibata², Sachiko Yano², Toru Shimazu², Shohei Matsumoto³, Haruo Kasahara³, Ikuko Osada³, Motoshi Kamada⁴, Chiaki Yamazaki⁵, Toshiya Muranaka⁶, Takashi Hashimoto⁷ (1 Department of Biology, Graduate School of Science, Osaka City University, Japan, 2 Japan Aerospace Exploration Agency, Japan, 3 Japan Manned Space Systems, Japan, 4 Advanced Engineering Services, Japan, 5 Japan Space Forum, Japan, 6 Osaka University, Japan, 7 Nara Institute of Science and Technology, Japan)

16:05-16:20 27SPI-6

The Effect of Microgravity on Rice Calli

Jing Jin^{1,2*}, Haiying Chen¹, Weiming Cai^{1,2} (1 Institute of Plant Physiology and Ecology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, China, 2 University of Chinese Academy of Sciences, China)

Room B [11:00-12:00]

Combustion and Chemical Physics II Chair: Yuji Nakamura, Jeong Park

11:00-11:15 27Com-1

A Visual Study on Flame Height and Extinguishment in the Low-frequency Sound Waves

RuXue Kang, Ruowen Zong* (State Key Laboratory of Fire Science, University of Science and Technology of China, China)

11:15-11:30 27Com-2

Impact of Gravity on Extinction Limit of Spreading Flame over Wire Insulation

Osamu Fujita (Division of Mechanical and Space Engineering, Hokkaido University, Japan)

11:30-11:45 27Com-3

Effect of Pressure on the Pyrolysis Gas Transportation Characteristics of the Overloaded Wire Insulation in Nitrogen Environment

Kai Wang^{1,2}, Wei Xia^{1,2}, Baorui Wang¹, Wenjun Kong^{1*} (1 Key Laboratory of Light-duty Gas-turbine, Institute of Engineering Thermophysics, Chinese Academy of Sciences, China, 2 University of Chinese Academy of Sciences, China)

11:45-12:00 27Com-4

Experimental Facility for Wire Insulation Combustion in SJ-10

Wenjun Kong*, Baorui Wang, Kai Wang, Wei Xia (Key Laboratory of Light-duty Gas-turbine, Institute of Engineering Thermophysics, CAS, China)

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Room B [13:00-14:30]

Combustion and Chemical Physics III

Chair: Masao Kikuchi, Carlos Fernandez-Pello

13:00-13:15 27Com-5

Secondary Atomization Processes during Droplet Combustion of Multi-Component Fuel Based on BDF

Chiaki Kato*, Kei Uzuki, Osamu Imamura, Hiroshi Yamasaki, Hiroshi Nomura (College of Industrial Technology, Nihon University, Japan)

13:15-13:30 27Com-6

Radiative Heat Transfer Characteristics of Droplet Flames under CO₂ and Elevated Atmospheric Pressure Conditions

Seul-Hyun Park (Dept. of Mechanical Systems Engineering, Chosun University, Japan)

13:30-13:45 27Com-7

Cool-Flame Burning and Oscillations of n-Heptane Envelope Diffusion Flames in Microgravity

Fumiaki Takahashi^{1*}, Viswanath Katta², Michael Hicks³ (1 Case Western Reserve University, USA, 2 Innovative Scientific Solutions, Inc., USA, 3 NASA Glenn Research Center, USA)

13:45-14:00 27Com-8

Microgravity Experiments on Interaction between Flame-Spread and Droplet Motion in a n-Heptane Droplets Array

Ryota Momoi^{1*}, Shoki Hiraga¹, Shota Hokethu¹, Yusuke Suganuma², Hiroshi Nomura² (1 Graduate school of Industrial Technology, Nihon University, Japan, 2 College of Industrial Technology, Nihon University, Japan)

14:00-14:15 27Com-9

A Study on Droplet Interaction in Spontaneous Ignition of a Fuel Droplet Pair through Interferometry

Osamu Moriue, Masaoki Sugihara*, Yuuki Takeuchi, Eiichi Murase (Department of Mechanical Engineering, Kyushu University, Japan)

14:15-14:30 27Com-10

A Preliminary Experiment in Parabolic Flight for "Group Combustion" Experiment in KIBO/ISS on Flame Spread Over Fuel-Droplet Clouds

Yasuko Yoshida^{1*}, Narita Sano¹, Naoya Motomatsu¹, Kentaro Iwai¹, Takehiko Seo¹, Masato Mikami¹, Yuji Kan², Masao Kikuchi³ (1 Yamaguchi University, Japan, 2 Japan Manned Space Systems Corporation, Japan, 3 Japan Aerospace Exploration Agency, Japan)

Room B [14:45-16:20]

Facilities and Techniques of Microgravity Experiments I

Chair: Ryoji Imai, Thomas Driebe

14:45-15:05 27Fa-1K

Performance of Experimental Research for Evaporation and Condensation in Space

Zhi-Qiang Zhu^{1*}, Qiu-Sheng Liu¹, Zhen-Hui He², Yuan-Yuan Zhou³, Zhen-Qian Chen⁴, Jing-Chang Xie¹ (1 National Microgravity Laboratory, Institute of Mechanics, Chinese Academy of Sciences, China, 2 Center for Space Technology, Sun Yat-sen University, China, 3 Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China, 4 School of Energy and Environment, Southeast University, China)

15:05-15:20 27Fa-2

SJ-10 Satellite Life Science Experiment Facilities and Space Flight Experiments

Zhang Tao*, Zheng Weibo, Tong Guanghui, Zhang Meimin, Yuan Yongchun, Xu Zengchuang, Zhang Yin, Guo Yisong, Cheng Zhiyuan, Peng Fei, Wang Du, Xu Dazhao (Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China)

15:20-15:35 27Fa-3

The Control for Experiment Process of Coal Combustion in SJ-10 Satellite

Yu Qiang^{1*}, Zhang Hai², Xu Minghou³, Xue Changbin¹, Man Feng¹, Zhao Xunfeng¹, Geng Baoming¹, Wang Xiaoqing¹ (1 National Space Science Center, Chinese Academy of Sciences, China, 2 Department of Thermal Engineering, Tsinghua University, China, 3 State Key Laboratory of Coal Combustion, Huazhong University of Science and Technology, China)

15:35-15:50 27Fa-4

The Control System for Multifunction Furnace on SJ-10 Satellite

Geng Baoming^{1*}, Wang Xiaoqing¹, Zhao Xunfeng¹, Ai Fei², Pan Xiuhong², Yu Qiang¹ (1 National Space Science Center, Chinese Academy of Sciences, China, 2 Shanghai Institute of Ceramics, Chinese Academy of Sciences, China)

15:50-16:05 27Fa-5

The Experiment Payload Control System in SJ-10 Satellite

Xue Changbin*, Zhao Xunfeng, Geng Baoming, Wang Xiaoqing, Man Feng, Zhai Guangjie, Yu Qiang (National Space Science Center, CAS, China)

16:05-16:20 27Fa-6

Colloidal Material Box in SJ-10 Satellite

Man Feng^{1*}, Wang Yuren², Lan Ding², Xue Changbin¹, Zhao Xunfeng¹, Wang Xiaoqing¹, Geng Baoming¹, Zhai Guangjie¹, Yu Qiang¹ (1 National Space Science Center, Chinese Academy of Sciences, China, 2 Institute of Mechanics, Chinese Academy of Sciences, China)

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Room C [11:00-12:05]

Ground-based Microgravity Research Chair: Ryoji Imai, Ming-xiang Pan

11:00-11:20 27GM-1K

The German Microgravity Program in Physical Sciences

Thomas Driebe (*DLR Space Administration, Germany*)

11:20-11:35 27GM-2

Microstructural Evolution of Immiscible Fe_{58.63}Sn_{41.37} Alloy under Free Fall Condition

W. L. Wang*, Y. H. Wu, L. H. Liu, B. Wei (*Department of Applied Physics, Northwestern Polytechnical University, China*)

11:35-11:50 27GM-3

A Percolation Approach Considering Flame-spread Limit Based on Microgravity Experiments of Flame Spread of Droplet Arrays at Different Ambient Temperatures and Pressures

Herman Saputro^{1*}, Takehiko Seo², Masato Mikami² (*1 Sebelas Maret University, Indonesia, 2 Yamaguchi University, Japan*)

11:50-12:05 27GM-4

A New Method for Ground Based Microgravity Simulation in Space Mechanisms

Sun Jing ^{1*}, Qin Li ², Liang Bo ³, Liu Fucai ⁴, Wang Wenkui ⁵ (*1 School of Mechanical Engineering, Yanshan University, China, 2 School of Electrical Engineering, Yanshan University, China, 3 School of National Defense Science and Technology, Yanshan University, China, 4 Key Lab of Industrial Computer Control Engineering of Hebei Province, Yanshan University, China, 5 School of National Defense Science and Technology, Yanshan University, China*)

Room C [13:00-14:35]

Materials Sciences Chair: Takuya Goto, Won-Seung Cho

13:00-13:20 27Ma-1K

Electrochemical Recycling of CO₂ in Molten Salts

Takuya Goto^{1*}, Yoshiyuki Sometani¹, Masato Sakurai², Hiromitsu Kanakubo³, Yasuhiro Fukunaka⁴ (*1 Doshisha University, Japan, 2 Japan Aerospace Exploration Agency (JAXA), Japan, 3 National Institute of Advanced Industrial Science and Technology (AIST), Japan, 4 Waseda University, Japan*)

13:20-13:35 27Ma-2

Wetting of Molten Sn Solder on the SJ10-Recoverable Scientific Experiment Satellite

Zhangfu Yuan^{1,2}, Bingsheng Xu^{2*}, Likun Zang¹, Jingxia Liu², Mingyan Li¹ (*1 Collaborative Innovation Center of Steel Technology, University of Science and Technology Beijing, China. 2 Department of Energy & Resources Engineering, College of Engineering, Peking University, China*)

13:35-13:50 27Ma-3

The Effects of Phase Separation Kinetics on Core-Shell Struction Formation

Nan Wang*, Yinli Peng, Li Zhang (*Department of Applied Physics, Northwestern Polytechnical University, China*)

13:50-14:05 27Ma-4

Interactive Effects of Several Elements and Microgravity on Growth of Nickel-base Single Crystal Alloy

Xinghong Luo*, Dongyan Jin, Yang Li (*Key Laboratory of Nuclear Materials and Safety Assessment, Institute of Metal Research, Chinese Academy of Sciences, China*)

14:05-15:20 27Ma-5

Microstructure and Optical Properties of (Ba,Ca)(Ti,Zr)₂O₅ Glasses Prepared by Aerodynamic Levitator.

Kyu-Ho Lee¹, Gye-Hyeok Lee¹, Chi-Hoon Lee¹, Chi-Hwan Lee¹, Shinichi Yoda² and Won-Seung Cho^{1*} (*1 School of Materials Science and Engineering, Inha University, Korea, 2 Institute of Pulsed Power Science, Kumamoto University, Japan*)

14:20-14:35 27Ma-6

The solidification Mechanism Transition and Microstructure Evolution of Ternary Co-Cu-Sn Alloy during Microgravity Processing

Na Yan*, Weili Wang, Bingbo Wei (*Northwestern Polytechnical University, China*)

14:35-15:50 27Ma-7

Experimental Study in Microgravity on Fusion based Additive Manufacturing

Yifei Liu*, Tianjin Cheng (*Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China*)

15:50-15:05 27Ma-8

The Microgravity Influence on 3D Printing

Rui Dou*, Yifei Liu, Ming Liu, Li Wang, Gong Wang (*Technology and Engineering Center for Space Utilization, Chinese Academy of Sciences, China*)

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Room C [15:10-16:15]

Thermophysical Properties/Fundamental Physics

Chair: Shinsuke Suzuki, Xing-hong Luo

15:10-15:30 27ThFu-1K

Round Robin Test of Surface Tension Measurement of Liquid Titanium by Containerless Technique

Shumpei Ozawa^{1*}, Yu Kudo¹, Kazuhiko Kuribayashi¹, Yuki Watanabe², Takehiko Ishikawa³ *(1 Department of Advanced Materials Science and Engineering, Chiba Institute of Technology 2 Advanced Engineering Services Co. Ltd. 3 Ins. Space and Astronautical Sci., Japan Aerospace Exploration Agency)*

15:30-15:45 27ThFu-2

Surface Tension of Liquid Cu-Ag Brazing Filler Alloys Measured by Electromagnetic Levitation

Masaru Nishimura*, Shumpei Ozawa, Kazuhiko Kuribayashi *(Department of Mechanical Science and Engineering, Chiba Institute of Technology, Japan)*

15:45-16:00 27ThFu-3

Thermophysical Properties and Solidification Mechanisms of Liquid Ternary Ti-Al-Nb Alloys

Kai Zhou*, Bingbo Wei *(MOE Key Laboratory of Space Applied Physics and Chemistry, Department of Applied Physics, Northwestern Polytechnical University, China)*

16:00-16:15 27ThFu-4

Progress of Electrostatic Accelerometer for TISS Mission

Yanzheng Bai*, Jianbo Yu, ShaoBo Qu, Shuchao Wu, Zebing Zhou *(MOE Key Laboratory of Fundamental Quantities Measurement, Institute of Geophysics, School of Physics, Huazhong University of Science and Technology, China)*

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Room A [11:00-12:00]

Space Living, Attire and Foods Chair: Kunihiro Tanaka, Jin Lee

11:00-11:15 28SA-1

Voluntary-Vaporization Enhances Cooling Effects for Extravehicular Activity

Kunihiro Tanaka^{1*}, Daiki Nagao², Kosuke Okada², Koji Nakamura¹ (1 Graduate School of Health and Medicine, Gifu University of Medical Science, Japan, 2 Department of Radiological Technology, Gifu University of Medical Science, Japan)

11:15-11:30 28SA-2

Changes of Productive Abilities of Nutritional Substances, Mainly Polyphenol, under the Pseudo-Microgravity

Kaori Tomita-Yokotani^{1*}, Maki Asano¹, Ken Iimura¹, Kanae Hiraishi¹, Shunta Kimura¹, Yasuko Kimura² (1 University of Tsukuba, Japan, 2 Jumonji University, Japan)

11:30-11:45 28SA-3

Performance Validation of Microgravity Active Vibration Isolation System on Parabolic Flight

Zhang Yongkang^{*}, Dong Wenbo, Liu Wei, Lv Shimeng, Li Zongfeng, Yang Yang (Key Laboratory of Space Utilization, Technology and Engineering Center for space Utilization, Chinese Academy of Sciences, China)

11:45-12:00 28SA-4

Transcriptome Analysis of Rice Seeds after Long-term Exposure to Outside of International Space Station

Manabu Sugimoto^{1*}, Youko Oono², Kawahara Yoshihiro², Oleg Gusev³, Masahiko Maekawa¹, Takashi Matsumoto², Margarita Levinskikh⁴, Vladimir Sychev⁴, Natalia Novikova⁴, Anatoly Grigoriev⁴ (1 Institute of Plant Science and Resources, Okayama University, Japan, 2 National Institute of Agrobiological Sciences, Japan, 3 Preventive Medicine and Diagnosis Innovation Program, RIKEN, Japan, 4 Institute of Biomedical Problem of Russian Academy of Sciences, Russia)

Room A [13:00-14:40]

Space Life Science III Chair: Kaori Tomita-Yokotani, Fengyuan Zhuang

13:00-13:20 28SLI-1K

The Regulation of Hepcidin on Iron Metabolism Contributes to Unloading Induced Bone Loss

Yingxian Li¹, Zi Xu², Yanzhong Chang², Fengyuan Zhuang^{3*} (1 State Key Lab of Space Medicine Fundamentals and Application, China Astronaut Research and Training Center, China, 2 Key Laboratory of Animal Physiology, Biochemistry and Molecular Biology of Hebei Province, College of Life Science, Hebei Normal University, China, 3 School of Biological Science and Medical Engineering, Beijing University of Astronautics and Astronautics, China)

13:20-13:40 28SLI-2K

Adaptation Mechanism of Intrinsically Unstable Human Cell and Body that Enables Bipedal Walking on the Earth: A Key Molecular Chaperone Keeping Dynamically Functional Shape, α B-crystallin, which Decreases in Microgravity

Yoriko Atomi (Aculty and Graduate School of Engineering, Tokyo University of Agriculture and Technology, Japan)

13:40-13:55 28SLI-3

The Tanpopo Mission: Japan's First Astrobiology Mission on the International Space Station to Examine Possible Interplanetary Migration of Microbes and Delivery of Bioorganic Compounds by Cosmic Dust

Kensei Kobayashi^{1*}, Hirofumi Hashimoto², Nobuhiro Hayashi³, Masumi Higashide⁴, Eiichi Imai⁵, Yukihiro Ishibashi⁶, Yuko Kawaguchi⁷, Hideyuki Kawai⁸, Yoko Kebukawa¹, Hajime Mita⁹, Kazumichi Nakagawa¹⁰, Kyoko Okudaira¹¹, Satoshi Sasaki¹², Makoto Tabata⁸, Kaori Tomita-Yokotani¹³, Hikaru Yabuta¹⁴, Hajime Yano², Shin-ichi Yokobori⁷, Akihiko Yamagishi⁷, Tanpopo Research Team⁴ (1 Yokohama National University, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 3 Tokyo Institute of Technology, Japan, 4 Japan Aerospace Exploration Agency, Japan, 5 Nagaoka University of Technology, Japan, 6 Kyushu University, Japan, 7 Tokyo University of Pharmacy and Life Sciences, Japan, 8 Chiba University, Japan, 9 Fukuoka Institute of Technology, Japan, 10 Kobe University, Japan, 11 University of Aizu, Japan, 12 Tokyo University of Technology, Japan, 13 Tsukuba University, Japan, 14 Osaka University, Japan)

13:55-14:10 28SLI-4

Dry Heat Tolerance of a Terrestrial Cyanobacterium, *Nostoc* sp. HK-01

Shunta Kimura^{1*}, Kotomi Inoue¹, Hiroshi Katoh², Seigo Sato¹, Sosaku Ichikawa¹, Kaori Tomita-Yokotani¹ (1 Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan, 2 Life Science Research Center, Mie University, Japan)

14:10-14:25 28SLI-5

Environmental Remediation and Possibility of Space Utilization using Terrestrial Cyanobacterial Sheet

Hiroshi Katoh^{1*}, Mika Yokoshima², Shunta Kimura², Jun Furukawa², Kaori Tomita-Yokotani², Yuji Yamaguchi³, Hiroyuki Takenaka³, Nobuyuki Kohno⁴ (1 Life Science Research Center, Mie University, Japan, 2 Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan, 3 MicroAlgae Corporation, Japan, 4 Research and Development Department, Takino Filter Inc., Japan)

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14:25-14:40 28SLI-6

Developmental Characteristics of the Changes in the Cardiovascular Parameters during 90 Degrees Head-up Tilting in Anesthetized Rats

Chiho Hashimoto^{1*}, Masao Yamasaki², Hironobu Nishimura³, Tetsuya Hiraiwa⁴, Yuri Sakai¹, Yusuke Kayama¹ (1 Undergraduate Student, Faculty of Clinical Engineering, Sch. of Health Sci., Fujita Health Univ., Japan, 2 Department of Physiology, Graduate & Undergraduate Sch. of Health Sci., Fujita Health Univ., Japan, 3 Doctoral Course Student, Dept. of Physiol., Graduate Sch. of Health Sci., Fujita Health Univ., Japan, 4 Master Course Student, Graduate Sch. of Health Sci., Fujita Health Univ., Japan)

Room A [14:50-16:40]

Space Plant II Chair: Jun Hidema, Hui Qiong Zheng

14:50-15:10 28SPI-1K

Photoperiod-controlling Flowering of Arabidopsis and Rice in Microgravity

Hui Qiong Zheng*, Lihua Wang, Yue Zhang (1 Life Science Research Center, Mie University, Japan, 2 Graduate School of Life and Environmental Sciences, University of Tsukuba, Japan, 3 MicroAlgae Corporation, Japan, 4 Research and Development Department, Takino Filter Inc., Japan)

15:10-15:25 28SPI-2

The Facility for Higher Plant Culture on Orbit

Tong Guang Hui*, Yuan Yong Chun, Zheng Wei Bo, Zhang Tao (Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China)

15:25-15:40 28SPI-3

A higher Plant Culture Apparatus (HPCA) on Chinese Recoverable Science Experiment Satellite SJ-10

Xu Zengchuang*, Zhang Tao, Tong Guanghui, Zheng Weibo, Xu Dazhao, Guo Yisong (Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China)

15:40-15:55 28SPI-4

A Pathway that Laterally Transports Auxin from the Upper Side to the Lower Side of the Transition Zone of Cucumber Seedlings via Endodermal Layers is Formed Due to Gravitstimulation

Nobuharu Fujii^{1*}, Chiaki Yamazaki^{1,5}, Yutaka Miyazawa², Motoshi Kamada³, Haruo Kasahara⁴, Ikuko Osada⁴, Toru Shimazu^{5,6}, Yasuo Fusejima⁵, Akira Higashibata⁶, Takashi Yamazaki⁷, Noriaki Ishioka⁸, Hideyuki Takahashi¹ (1 Graduate School of Life Sciences, Tohoku University, Japan, 2 Faculty of Science, Yamagata University, Japan, 3 Advanced Engineering Services Co., Ltd., Japan, 4 Japan Manned Space Systems Co., Ltd., Japan, 5 Japan Space Forum, Japan, 6 Human Spaceflight Technology Directorate, Japan Aerospace Exploration Agency, Japan, 7 Graduate School of Medicine, Teikyo University, Japan, 8 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan)

15:55-16:10 28SPI-5

A Noncontact Measuring Method for Estimating Leaf Stomatal Conductance from Thermal Measurements of Intact Leaves and Wet and Dry Imitation Leaves

Yoshiaki Kitaya^{1*}, Hiroaki Hirai¹, Ayako Tokuda¹, Sachiko Yano² (1 Graduate Graduate School of Life and Environmental Sciences, Osaka Prefecture University, 2 Japan Aerospace Exploration Agency, Japan)

16:10-16:25 28SPI-6

Silkworm Culture Apparatus (SCA) and its Space Flight Experiment on China Recoverable Science Experiment SJ-10 Satellite

Zhang Meimin*, Zhang Tao, Zheng weibo, Jianzhong Gu (Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China)

16:25-16:40 28SPI-7

Towards Microgravity Experiments in Moss: Emerging Model Land Plant, Physcomitrella Patens for Experiments on International Space Station

Tomomichi Fujita^{1*}, Atsushi Kume², Hiroyuki Kamachi³, Yuko Hanba⁴, Ichirou Karahara³ (1 Grad Sch of Sci., Hokkaido Univ, Japan, 2 Grad Sch of Agr, Kyushu Univ, Japan, 3 Grad Sch of Sci & Eng, Toyama Univ, Japan, 4 Dept of Appl Biol, Kyoto Inst of Tech, Japan)

Room B [11:00-12:00]

Combustion and Chemical Physics IV Chair: Osamu Moriue, Shuangfeng Wang

11:00-11:15 28Com-1

Examination of the Inert-Gas Capsule Method for Extinguishing a Fire in a Confined Space Environment

Hiroyuki Torikai*, Shinya Kudo, Akihiko Ito (Graduate School of Science and Technology, Hirosaki University, Japan)

11:15-11:30 28Com-2

Effect of Non-Thermal Plasma on Combustion Stability in a Premixed Gas Turbine Combustor

Gyeong Taek Kim*, Won June Lee, Jeong Park*, Min Kuk Kim, Sang Min Lee (Interdisciplinary Program of Biomechanical Engineering, Pukyong National University, Korea)

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11:30-11:45 28Com-3

Stabilization of Lifted Laminar Methane Flames in Co-flow Jet

Narayan P. Sapkal^{1*}, Jeong Park¹, Byeong Jun Lee², Won June Lee¹, Oh Boong Kwon¹ (1 Department of Mechanical Engineering, Pukyong National University, Republic of Korea, 2 School of Mechanical Engineering, Yeungnam University, Korea)

11:45-12:00 28Com-4

Cellular Instabilities and Laminar Burning Velocity in Methane/Ethylene-Air Premixed Flames

K. H. Van^{1*}, J. Park¹, Dae Keun Lee², Seung Gon Kim², Young Tae Guahk², Dong-Soon Noh² (1 Dept. of Mechanical Engineering, Pukyong National University, Korea, 2 Advanced Combustion Lab, Korea Institute of Energy Research, Korea)

Room B [13:00-13:50]

Facilities and Techniques of Microgravity Experiments II

Chair: Ichiro Ueno

13:00-13:20 28Fa-1K

Control Performance Test of Microgravity Active Isolation System by Aircraft Parabolic Flight

Liu Wei^{1,2*}, Yang Yang¹, Gao Yang¹ (1 Key Laboratory of Space Utilization, Technology and Engineering Center for space Utilization, Chinese Academy of Sciences, China, 2 University of Chinese Academy of Sciences, China)

13:20-13:35 28Fa-2

The Bioreactor on the TianZhou Cargo Transport Spacecraft

Fangwu Liu*, Yongchun Yuan, Tao Zhang, Weibo Zheng, Guanghui Tong, Yin Zhang, Meimin Zhang (Shanghai Institute of Technical Physics, CAS, China)

13:35-13:50 28Fa-3

Research on a Pendulum Bench for the Test of Electrostatic Accelerometer on Ground

B. X. Yang, S. Hu, L. Liu, S. B. Qu, Y. Z. Bai, S. C. Wu*, Z. B. Zhou (MOE Key Laboratory of Fundamental Physical Quantities Measurement, School of Physics, Huazhong University of Science and Technology, China)

Room B [14:00-15:30]

Crystal G, Protein and Colloids I

Chair: Yuko Inatomi, Xing-hong Luo

14:00-14:20 28Cr-1K

Protein Crystal Growth Experiments in Space

Hiroaki Tanaka (Confocal Science Inc., Japan)

14:20-14:40 28Cr-2K

Growth and Dissolution Rates of InGaSb Crystal under Reduced Convection Condition

Yuko Inatomi^{1,2*}, Velu Nirmal Kumar^{3,4}, Mukannan Arivanandhan⁵, Govindasamy Rajesh³, Kaoruho Sakata¹, Tadanobu Koyama³, Yoshimi Momose³, Yasunori Okano⁶, Yasuhiro Hayakawa³ (1 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 2 School of Physical Sciences, SOKENDAI (The Graduate University for Advanced Studies), Japan, 3 Research Institute of Electronics, Shizuoka University, Japan, 4 Graduate School of Science and Technology, Shizuoka University, Japan, 5 Centre for nanoscience and technology, Anna University, India, 6 Graduate school of Engineering Science, Osaka University, Japan)

14:40-15:00 28Cr-3K

What Has Been Characterized by In-Situ Observation of Crystal Growth in Space?

Katsuo Tsukamoto (Osaka Univ./Tohoku Univ., Japan)

15:00-15:15 28Cr-4

Self-assembled 2D and 3D Clusters using Janus Microcylinders with Controlled Geometrical and Chemical Anisotropy

Jongmin Kim^{1*}, Dong-Young Kim¹, Myung-Suk Oh², Sung Gap Im², Chang-Soo Lee¹ (1 Department of Chemical Engineering, Chungnam National University, Korea, 2 Department of Chemical and Biomolecular Engineering and KI for NanoCentury, Korea Advanced Institute of Science and Technology, Korea)

15:15-15:30 28Cr-5

Self-Assembly of Colloidal Spheres and Liquid Crystal Phase Transitions in Space

YuRen Wang (Institute of Mechanics, Chinese Academy of Sciences, China)

Room B [15:40-16:45]

Electrostatic Levitation

Chair: Takehiko Ishikawa, Geun Woo Lee

15:40-16:00 28Ele-1K

Interfacial Phenomena and Thermophysical Properties of Molten Steel and Oxides

Masahito Watanabe^{1*}, Toshihiro Tanaka², Takao Tsukada³, Takehiko Ishikawa⁴, Haruka Tamaru⁴ (1 Gakushuin University, Japan, 2 Osaka University, Japan, 3 Tohoku University, Japan, 4 Japan Aerospace Exploration Agency (JAXA), Japan)

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16:00-16:15 28El6-2

Operation Status of the Electrostatic Levitation Furnace (ELF) in the ISS-KIBO

Haruka Tamaru^{1*}, Satoshi Yukizono¹, Hideki Saruwatari¹, Yasuhiro Nakamura¹, Takehiko Ishikawa², Tetsuya Takada³, Yumiko Sakai³ (1 JEM Utilization Center, Japan Aerospace Exploration Agency, Japan, 2 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 3 Space System Department, IHI Aerospace Co., Ltd., Japan)

16:15-16:30 28El6-3

Emissivity Measurements of Liquid Ni and Rh with an Electrostatic Levitator

Takehiko Ishikawa^{1*}, Yuki Watanabe², Junpei T. Okada³, P.-F. Paradis⁴ (1 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 2 A.E.S Co. Ltd, Japan, 3 Tohoku University, Japan, 4 INO, Canada)

16:30-16:45 28El6-4

Thermophysical Properties of Metastable Liquid Ni-Nb Alloys under Electrostatic Levitation Condition

Liang Hu^{*}, Shangjing Yang, Lei Wang, Bingbo Wei (Department of Applied Physics, Northwestern Polytechnical University, China)

Room C [11:00-12:05]

Heat & Fluid Flow in Microgravity I Chair: Taishi Yano, Qi Kang

11:00-11:20 28HF-1K

Significance of Boiling Two-Phase Flow Experiment onboard International Space Station

Satoshi Matsumoto^{1*}, Ohta Haruhiko², Hitoshi Asano³, Osamu Kawanami⁴, Koichi Suzuki⁵, Ryoji Imai⁶, Yasuhisa Shinmoto², Kenichiro Sawada¹ (1 Japan Aerospace Exploration Agency, Japan, 2 Kyushu University, Japan, 3 Kobe University, Japan, 4 University of Hyogo, Japan, 5 Tokyo University of Science, Japan, 6 Muroran Institute of Technology, Japan)

11:20-11:35 28HF-2

SOBER-SJ10: Space Experiment on Microgravity Boiling Heat Transfer

Ke Wu¹, Jian-Fu Zhao^{1*}, Hui-Xiong Li², Kai Li¹ (1 Key Laboratory of Microgravity/CAS, Institute of Mechanics, Chinese Academy of Sciences, China, 2 State Key Laboratory of Multiphase Flow in Power Engineering, Xi'an Jiaotong University, China)

11:35-11:50 28HF-3

Space Experimental Investigation of Drop Evaporation Process onboard Scientific Satellite SJ10: Preliminary Results and Theoretical Analyses

Qiu Sheng Liu^{1*}, Zhiqiang Zhu¹, Guofeng Xu¹, Xue Chen^{1,2}, Paul G. Chen², Yuan Gao¹, Hai Lin¹, Jingchang Xie¹ (1 Institution of Mechanics, Chinese Academy of Sciences, China, 2 Aix-Marseille Universit, CNRS, France)

11:50-12:05 28HF-4

Research on Liquid Management Technology in Water Tank and Reactor for Propulsion System with Hydrogen Production System Utilizing Aluminum and Water Reaction

Ryoji Imai^{1*}, Sho Goto¹, Takuya Imamura¹, Masayuki Saito¹, Hideyuki Onodera¹, Masatoshi Sugioka², Kazuyuki Higashino² (1 Aerospace System Engineering Research Unit, Muroran Institute of Technology, Japan, 2 Aerospace Plane Research Center, Muroran Institute of Technology, Japan)

Room C [13:00-14:30]

Heat & Fluid Flow in Microgravity II Chair: Satoshi Matsumoto, Zhi-Qiang Zhu

13:00-13:15 28HF-5

Numerical Study of the Influence of Gravity on Square Minichannel Condensation

Chen Zhenqian, Li Panpan^{*} (School of Energy and Environment, Southeast University, China)

13:15-13:30 28HF-6

Study on Dynamic Wetting Behavior in Microgravity Condition Targeted for Propellant Tank

Ryoji Imai^{*}, Yuji Amano, Shuhei Yuze (Aerospace System Engineering Research Unit, Muroran Institute of Technology, Japan)

13:30-13:45 28HF-7

Effect of Axial Magnetic Field on Marangoni-thermocapillary Convection in a Shallow Annular Pool under Microgravity

Lan Peng, Fei Rao^{*} (College of Power Engineering, Chongqing University, China)

13:45-14:00 28HF-8

Long Distance Heat Transport with Magnetically-Driven Temperature-Sensitive Magnetic Fluid

Yuhiko Iwamoto^{1*}, Yasushi Ido¹, Haruhiko Yamasaki², Hiroshi Yamaguchi² (1 Department of Electrical and Mechanical Engineering, Nagoya Institute of Technology, Japan, 2 Department of Mechanical Engineering, Doshisha University, Japan)

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14:00-14:15 28HF-9

Thermocapillary Convection Experiment in an Open Annular Pool on SJ-10 Satellite

Li Duan*, Qi Kang, Di Wu, Huan Jiang, Chu Zhang, Wenrui Hu (National Microgravity Laboratory / CAS, Institute of Mechanics, Chinese Academy of Sciences, China)

14:15-14:30 28HF-10

A Linear Stability Analysis of Thermal Convection in a Cylindrical Annulus Subjected to Complex Temperature Gradients

Jia Liu*, Lan Peng, Fei Rao (College of Power Engineering, Chongqing University, China,)

Room C [14:45-16:35]

Fluid Physics Chair: Ichiro Ueno, Jian-Fu Zhao

14:45-15:05 28FI-1K

Acceleration of Macroscopic Contact Line of Droplet Spreading on a Smooth Substrate Induced by Interaction with a Spherical Particle

Lizhong Mu^{1*}, Daichi Kondo³, Motochika Inoue³, Farzam Zoueshtiagh², Ichiro Ueno^{1,3} (1 Research Institute of Science & Technology, Tokyo Univ. Science, Japan, 2 Universite de Lille, IEMN, CNRS, France, 3 Dept. Mechanical Engineering, Fac. Science & Technology, Tokyo Univ. Science, Japan)

15:05-15:20 28FI-2

Generation of Droplets by Negative Pressure-Induced Flow without External Apparatuses

Dong-Yeong Kim, Si Hyung Jin, Chang-Soo Lee* (Department of Chemical Engineering, Chungnam National University, Korea)

15:20-15:35 28FI-3

Evolution of Thermal Patterns during Steady State Evaporation of Sessile Droplets

Chunmei Wu*, Shuang Ye, Yue Li, Lin Ding, Yourong Li (Key Laboratory of Low-grade Energy Utilization Technologies and Systems of Ministry of Education, College of Power Engineering, Chongqing University, China)

15:35-15:50 28FI-4

Characteristics of Dynamic Surface Deformation of Oscillatory Marangoni Convection in Liquid Bridge

Ryosuke Seki^{1*}, Yutaro Isonishi¹, Taishi Yano¹, Koichi Nishino¹, Yasuhiro Kamotani², Satoshi Matsumoto³, Ichiro Ueno⁴, Atsuki Komiya⁵, Masahiro Kawaji⁶, Nobuyuki Imaishi⁷ (1 Department of Mechanical Engineering, Yokohama National University, Japan, 2 Case Western Reserve University, Japan, 3 Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency, Japan, 4 Department of Mechanical Engineering, Tokyo University of Science, Japan, 5 Department of Mechanical Engineering, Tohoku University, Japan, 6 Department of Chemical Engineering & Applied Chemistry, University of Toronto, Japan, 7 Department of Mechanical Engineering, Kyusyu University, Japan)

15:50-16:05 28FI-5

Experimental Study on Pattern Transition of Thermocapillary

Chunmei Wu*, Lin Ding, Yourong Li (Key Laboratory of Low-grade Energy Utilization Technologies and Systems of Ministry of Education, College of Power Engineering, Chongqing University, Chongqing, China)

16:05-16:20 28FI-6

Effect of Cooling Disk Temperature and Interfacial Heat Transfer on the Instability of Marangoni Convection in Liquid Bridge

Makoto Hirotsu^{1*}, Taishi Yano¹, Koichi Nishino¹ (1 Department of Mechanical Engineering, Yokohama National University, Japan)

16:20-16:35 28FI-7

Effective Marangoni Number and Spatiotemporal Structure of Flow Velocity in High Prandtl Number Fluid

Shinichi Yoda^{1,2*}, Satoshi Matsumoto¹, Ichiro Ueno³ (1 ISAS/JAXA, Japan, 2 Kumamoto Univ., Japan, 3 Tokyo University of Science, Japan)