

Preface

Welcome to the Eighteenth International Conference on Flow Dynamics (ICFD2021) hosted by the Institute of Fluid Science, Tohoku University.

As you all know, the world has been significantly affected by COVID-19, and although we are overcoming the threat, we are still not entirely safe. Therefore, with the safety of the participants as our top priority, we decided to hold ICFD2021 as a web-based virtual meeting, as we did last year.

Flow Dynamics is a broad research field that deals with the flow and transport phenomena concerning electrons, molecules and nanoparticles, any continuum fluids and materials, energy, information, and so forth. ICFD is expected to play significant roles in helping Flow Dynamics be a significant academic discipline that deals with various issues that human society faces, such as new energy, environment, resource, and diseases.

ICFD works as a platform of discussion to reach scientific truth and engineering solutions for all the flow-relevant problems. A wide variety of sessions are organized in ICFD to provide the seeds and fulfill the needs from the viewpoint of Flow Dynamics. We would be very grateful if it contributes to initiating scientific and technical exchanges and international research collaboration.

Another significance of this conference is that it provides unique opportunities for young researchers and students to be educated and self-developed through participation and presentation in the Student Session and special events.

The technical program consists of 3 plenary lectures, 1 General Session, 22 Organized Sessions, starting in the morning on Wednesday, October 27. Approximately 400 papers will be presented. It is our great pleasure to meet a large number of participants during the conference. The proceedings papers for OS10 and OS13 in ICFD2021 are peer-reviewed.

On behalf of the ICFD2021 organizing committee, we hope you would enjoy fruitful discussions and exchanges of information, and we would like you to have the opportunities to strengthen your friendships and meet new friends.

Shigeru Obayashi, Professor,
Institute of Fluid Science,
Tohoku University
and

Hong G. Im, Professor, Mechanical Engineering
Clean Combustion Research Center
King Abdullah University of Science and Technology
General Co-Chairs, ICFD2021

Eighteenth International Conference on Flow Dynamics

Organized by:

- Executive Committee of International Conference Flow Dynamics

Supported by:

- Institute of Fluid Science, Tohoku University

In cooperation with:

- CFD-Bio
- Combustion Society of Japan
- Computational Science and Engineering Division, Atomic Energy Society of Japan
- Cryogenics and Superconductivity Society of Japan
- Japan Aerospace Exploration Agency
- Japan Foundry Engineering Society
- Japan Society of Maintenology
- Japanese Society of Biorheology
- The Electrochemical Society of Japan
- The Japan Society for Aeronautical and Space Sciences
- The Japan Society for Computational Engineering and Science
- The Japan Society of Applied Electromagnetics and Mechanics
- The Japan Society of Fluid Mechanics
- The Japan Society of Mechanical Engineers
- The Japan Society of Microgravity Application
- The Japanese Society for Multiphase Flow
- The Japanese Society for Non-Destructive Inspection

Supported by a grant from:

- Intelligent Cosmos Academic Foundation

SCOPE:

The 18th International Conference on Flow Dynamics (ICFD2021), in the annual series since 2004, will be held from October 27th to 29th, 2021, at Sendai, Japan. This conference aims to explore new horizons in science and technology in Flow Dynamics by discussing and exchanging information related to the most advanced scientific fields and cutting-edge technologies. ICFD is now recognized by researchers and engineers all over the world as one of the largest and the most important international conferences in the field of Flow Dynamics. It has also been playing an important role in promoting international research collaborations. Especially, ICFD2021 focuses on energy-related topics, such as clean energy, hydrogen energy, and natural energy. In addition, it should be noted that ICFD provides young researchers and students with unique opportunities to develop themselves through proactive participation in the conference, and young researchers and students are encouraged by awards.

The first nine ICFDs were hosted by two Tohoku University COE Programs: “The 21st Century International COE on Fluid Dynamics (21COE, Year 2003 - Year 2007)” and its successor “Global COE Program World Center of Education and Research for Trans-disciplinary Flow Dynamics (GCOE, Year 2008 - Year 2012)”. Institute of Fluid Science (IFS), Tohoku University, was responsible for both 21COE and GCOE programs. GCOE ended in March of 2013. In 2013, on the occasion of its 70th anniversary, IFS was reorganized as an even more powerful research institute, particularly in energy-related research, with three new research divisions and an Innovative Energy Research Center. In this movement, IFS decided to continue to support this conference series, and ICFDs have been held annually since 2013. We pledge to maintain ICFD's dynamism and spirit as a meeting for distinguished scientists in Flow Dynamics as well as future generations of scientists and engineers.

Flow Dynamics is a broad scientific field that deals with flow and transport phenomena concerning electrons, molecules, nanoscale particles, any continuum fluid with and without chemical reaction, any material, energy, information, economic activity, and so forth. It addresses multiscale, multiphysics, and multidisciplinary problems and deals with all-natural phenomena, including bio-processes, corrosion, weather, volcanic eruptions, earth magnetic field, and tectonic motions, and with most human activities such as industrial processes, energy production & saving, and transportation. ICFD is expected to play a significant role in encouraging Flow Dynamics to become a major academic discipline, which deals with various challenging tasks that human society faces,

such as control of nuclear power generators, global warming, energy, resource, and diseases. We expect all scientists and engineers who are working or are interested in such areas to participate in ICFD2021 and extend their research areas and international human networks.

ICFD serves as a platform of discussion to reach scientific truth and engineering solutions for all the flow-relevant problems. We cordially invite researchers, teachers, students, and planners exploring and studying in the relevant research and development fields of energy, bio-, nano-, material, environmental, planetary, and earth sciences and technologies, particularly in the academic fields of mechanical engineering, aerospace engineering, nuclear engineering, physics, medical science and engineering, chemistry, chemical engineering, and all other areas.

We are still in the middle of the COVID-19 pandemic, although we are overcoming the threat. With the safety of the participants as our top priority, we decided to hold ICFD2021 as a web-based virtual meeting, as we did last year. We will do our best to make ICFD2021 successful as an online conference.

CONFERENCE COMMITTEE:

Executive Committee Members:

Shigeru Obayashi (General Co-Chair of ICFD2021, Tohoku University)

Hong G. Im (General Co-Chair of ICFD2021, King Abdullah University of Science and Technology)

Kaoru Maruta (IFS Director, Tohoku University)

International Scientific Committee Members:

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Weihua Li (University of Wollongong)

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Vincent Fridrici (ECL)

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Kaoru Maruta (Tohoku University)

Hideya Nishiyama (Osaka University)

Shigeru Obayashi (Tohoku University)

Taku Ohara (Tohoku University)

Akihiro Sasoh (Nagoya University)

Takehiko Sato (Tohoku University)

Toru Shimada (Japan Aerospace Exploration Agency)

Toshiyuki Takagi (Tohoku University)

Michio Tokuyama (Tohoku University)

Satoru Yamamoto (Tohoku University)

Kazuya Yoshida (Tohoku University)

Korea

Jinsoo Cho (Hanyang University)

Nam Il Kim (KAIST)

Hyung Jin Sung (KAIST)

Russia	Sergey S. Minaev (Far-Eastern Federal University)	Taiwan	Chingyao Chen (National Yang Ming Chiao Tung University)
Saudi Arabia	Hong G. Im (King Abdullah University of Science and Technology)		Yao-Hsien Liu (National Yang Ming Chiao Tung University)
Sweden	Fredrik Lundell (KTH Royal Institute of Technology)		Jongshinn Wu (National Yang Ming Chiao Tung University)
Switzerland	Bastien Chopard (University of Geneva)	USA	Igor V. Adamovich (The Ohio State University)
			Jeongmin Ahn (Syracuse University)
			Yiguang Ju (Princeton University)
			Kozo Saito (University of Kentucky)
			Rongjia Tao (Temple University)

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	Kazuhiro Nakahashi (Tohoku University)		

Organizing Committee Members:

Koji Shimoyama (Chair), Keisuke Asai, Akihiro Hayakawa, Kaoru Maruta, Hisanori Masuda, Hiroki Nagai, Shigeru Obayashi, Toshihiro Ogawa, Fukuo Ohta, Junnosuke Okajima, Shinichi Sato, Anna Suzuki (Observer) Tomohiro Okazaki

ICFD2021 Secretariat:

Natsuko Hatakeyama, Tomomi Nagayoshi

Plenary Lectures



Professor Eckart Meiburg (University of California at Santa Barbara, USA)

Title: “Particle-resolving Sediment Transport Simulations”



Professor Chung-Jen Tseng (National Central University, Taiwan)

Title: “Development of high performance PEM fuel cells”



Professor Junichiro Kawaguchi (Tohoku University, Japan)

Title: “Come up with the Reasons for Confidence, and Inspiration arises”

Sessions

General Session

GS1: General Session

Co-Organizers: S. Obayashi, K. Shimoyama (Tohoku University)

Organized Session

OS1 The Ninth International Symposium on Innovative Energy Research I & III

&OS3 OS1: Advanced Materials and its Energy Application

Organizer: S. Samukawa (Tohoku University)

OS3: The Ninth International Symposium on Innovative Energy Research III

Multiphase Energy Science and Technology (Combination of Monozukuri-Fluid Science / Engineering)

Organizer: J. Ishimoto (Tohoku University)

OS2: The Ninth International Symposium on Innovative Energy Research II

Combustion Technology and Fundamentals

Co-Organizers: P. Dagaut (CNRS-INSIS), H. Im (King Abdullah University of Science and Technology), N. I. Kim (KAIST), K. Maruta (Tohoku University)

OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition

Co-Organizers: T. Shimada (JAXA), K. Sawada (Tohoku University)

OS5: Advanced Applications of Multi-functional Fluids

Co-Organizers: H. Takana (Tohoku University), T. Fujino (University of Tsukuba), K. Doi (Toyohashi University of Technology), N. Takeuchi (Tokyo Institute of Technology), Y. Iwamoto (Nagoya Institute of Technology)

OS6: New Dimensions of Magnetic Suspension and Balance System

Co-Organizers: S. Obayashi, K. Asai (Tohoku University)

OS7: Smart Fluids & Soft Matters and Their Advanced Applications

Co-Organizers: M. Nakano (Tohoku University), X. Gong (University of Science and Technology of China), W. Li (University of Wollongong), G. Sebald (INSA Lyon / Tohoku University)

OS8: Advanced Physical Stimuli and Biological Responses

Co-Organizers: T. Sato (Tohoku University), T. Ohashi (Hokkaido University), S. Kawano (Osaka University), R. Shirakashi (The University of Tokyo)

OS9: Biomedical Flow Dynamics

Co-Organizers: H. Anzai (Tohoku University), M. Zhang (Macquarie University), K. Takashima (Kyushu Institute of Technology), T. Nakayama (National Institute of Technology, Tsuruoka College), A. Qiao (Beijing University of Technology), M. Ohta (Tohoku University)

OS10: Biomolecular Dynamics

Co-Organizers: Y. Mukai (Meiji University), K. Etchuya (Aoyama Gakuin University), M. Ohta (Tohoku University)

OS11: Microfluidics and Microphysiological Modeling

Co-Organizers: K. Funamoto (Tohoku University), T. Fukui (Kyoto Institute of Technology)

OS12: Canceled

- OS13: Flow Realization, Measurement and Visualization**
Co-Organizers: T. Yamagata (Niigata University), S. Funatani (Yamanashi University), S. Iio (Shinshu University), K. Funamoto (Tohoku University)
- OS14: Porous Media**
Co-Organizers: A. Suzuki (Tohoku University), S. Tupin (Imperial College London), Makoto Ohta (Tohoku University)
- OS15: Turbulence: from Fundamentals to Applications**
Co-Organizers: Y. Hattori (Tohoku University), T. Ishihara (Okayama University), Y. Tsuji (Nagoya University)
- OS16: Vortex Motion**
Co-Organizers: Y. Hattori (Tohoku University), S. Llewellyn Smith (UCSD)
- OS17: Supercritical Fluid**
Co-Organizers: Y. Kanda (Tohoku University), Y. Feng (Chinese Academy of Sciences), J. Chen (Chinese Academy of Sciences), A. Komiya (Tohoku University)
- OS18: Flow dynamics of diffusion-reactive and phase transition systems**
Co-Organizers: J. Okajima (Tohoku University), R. Fursenko (ITAM SB RAS), V. Gubernov (Lebedev Physical Institute RAS), S. Minaev (IAM FEB RAS)
- OS19: Liaison Office Session**
Co-Organizers: M. Ohta, T. Uchimoto, T. Tokumasu, A. Komiya (Tohoku University)
- OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics**
Co-Organizers: T. Akiba, T. Ikami, S. Morita (Tohoku University)
Supervisors: A. Suzuki, S. Takeda, Y. Kanda, J. Okajima, A. Hayakawa (Tohoku University)
- OS21: The 21st International Symposium on Advanced Fluid Information (AFI-2021) IFS Collaborative Research Forum**
Co-Organizers: H. Masuda, S. Obayashi (Tohoku University)
- Fluids Science Research Award Lectures**
Organizer: K. Maruta (Tohoku University)
- OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum**
Organizer: T. Uchimoto (Tohoku University)
- OS23: JSPS Core to Core program workshop**
-Construction of an international research exchange center for ammonia combustion and materials toward the realization of a low-carbon society-
Co-Organizers: K. Maruta (Tohoku University), M. Sarathy (KAUST), N. Mary (INSA-Lyon), F. Ohuchi (University of Washington)

General Information

Virtual Exhibition: Three Days (Remo) 9:00-18:00, October 27 & October 29, 2021 / 13:30-15:20, October 28, 2021

Exhibitor Presentation Session by Nobby Tech. Ltd. 12 : 40- on three days @ ROOM 1

Banquet: 19:00-20:00, October 28, 2021 (Remo)

IFS Tour: 9:20 a.m. -10:20 a.m. (JST), October 29, 2021 @ROOM 5 / 5:10 p.m. – 6:10 p.m. (JST), October 29, 2021 @ROOM 1 (Online)

8:00	Live Event								8:00
	Opening Address & Plenary Lecture								
9:00	BREAK / Exhibition (Remo)								9:00
9:20	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	9:20
10:50			OS1&OS3:The Ninth International Symposium on Innovative Energy Research I & III	OS7: Smart Fluids & Soft Matters and Their Advanced Applications		OS13: Flow Realization, Measurement and Visualization	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	10:50
	BREAK / Exhibition (Remo)								
11:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	11:10
12:40			GS: General Session	OS7: Smart Fluids & Soft Matters and Their Advanced Applications		OS13: Flow Realization, Measurement and Visualization	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	12:40
	Exhibitor Presentation Session	BREAK / Exhibition (Remo)							
13:30	ROOM 1	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	13:30	
15:00	"JSPS Core-to-Core - NH₃ combustion & materials - IFS Lyon Center" collaborative session OS23: JSPS Core to Core program workshop & OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum & OS2: Ninth Int. Symp. Innov. Energ. II: Combustion Tech. & Fundamentals		GS: General Session	OS7: Smart Fluids & Soft Matters and Their Advanced Applications		OS13: Flow Realization, Measurement and Visualization	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	15:00
	BREAK / Exhibition (Remo)								
15:20	ROOM 1	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	15:20	
16:50	"JSPS Core-to-Core - NH₃ combustion & materials - IFS Lyon Center" collaborative session OS23: JSPS Core to Core program workshop & OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum & OS2: Ninth Int. Symp. Innov. Energ. II: Combustion Tech. & Fundamentals		GS: General Session	OS7: Smart Fluids & Soft Matters and Their Advanced Applications		OS13: Flow Realization, Measurement and Visualization	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	16:50
	BREAK / Exhibition (Remo)								
17:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	17:10
18:40	OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum	OS2:The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals	OS18: Flow dynamics of diffusion-reactive and phase transition systems	OS7: Smart Fluids & Soft Matters and Their Advanced Applications	OS14: Porous Media		OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	18:40
	BREAK (Remo)								
19:00	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	19:00
20:00		OS2:The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals							20:00

9:00	Live Event									9:00
	Opening Address & Plenary Lectures									
11:00	BREAK (Remo)									11:00
11:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9	11:10
12:40			GS: General Session	OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition	OS10: Biomolecular Dynamics	OS15: Turbulence: from Fundamentals to Applications		OS21: Fluids Science Research Award Lecturers	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	12:40
13:30	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9	13:30
15:00		OS2: The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals	GS: General Session	OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition		OS15: Turbulence: from Fundamentals to Applications	OS17: Supercritical Fluid	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	15:00
15:20	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9	15:20
16:50	OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum	OS2: The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals	OS18: Flow dynamics of diffusion-reactive and phase transition systems	OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition		OS15: Turbulence: from Fundamentals to Applications	OS17: Supercritical Fluid	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	16:50
17:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9	17:10
18:40	OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum	Collaborative Session of OS2 and OS18 OS2: Ninth Int. Symp. Innov. Energ. II: Tech. & Fundamentals & OS18: Flow dynamics of diffusion-reactive and phase transition systems		OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition	OS9: Biomedical Flow Dynamics	OS15: Turbulence: from Fundamentals to Applications	OS17: Supercritical Fluid	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	18:40
19:00	BREAK (Remo)									19:00
	Remo									
20:00	Banquet									20:00

8:00	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	8:00
	OS6: New Dimensions of Magnetic Suspension and Balance System		OS11: Microfluidics and Microphysiological Modeling				OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
9:00	BREAK / Exhibition (Remo)								9:00
9:20	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	9:20
	OS6: New Dimensions of Magnetic Suspension and Balance System	OS5: Advanced Applications of Multi-functional Fluids	GS: General Session	OS8: Advanced Physical Stimuli and Biological Responses	IFS Tour	OS16: Vortex Motion	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
10:50	BREAK / Exhibition (Remo)								10:50
11:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	11:10
		OS5: Advanced Applications of Multi-functional Fluids	GS: General Session	OS8: Advanced Physical Stimuli and Biological Responses		OS16: Vortex Motion	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
12:40	Exhibitor Presentation Session	BREAK / Exhibition (Remo)							12:40
13:30	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	13:30
		OS5: Advanced Applications of Multi-functional Fluids		OS8: Advanced Physical Stimuli and Biological Responses		OS16: Vortex Motion	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
15:00	BREAK / Exhibition (Remo)								15:00
15:20	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	15:20
		OS5: Advanced Applications of Multi-functional Fluids	OS11: Microfluidics and Microphysiological Modeling	OS8: Advanced Physical Stimuli and Biological Responses	OS9: Biomedical Flow Dynamics		OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
16:50	BREAK / Exhibition (Remo)								16:50
17:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	17:10
	IFS Tour	OS5: Advanced Applications of Multi-functional Fluids	OS11: Microfluidics and Microphysiological Modeling	OS8: Advanced Physical Stimuli and Biological Responses	OS9: Biomedical Flow Dynamics		OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
18:40	BREAK (Remo)								18:40
19:00	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	19:00
			OS11: Microfluidics and Microphysiological Modeling						
20:00									20:00

8:00	Live Event								8:00
	8:00-8:10 Opening Address 8:10-9:00 Plenary Lecture 8:10-9:00 "Particle-resolving Sediment Transport Simulations" <i>Eckart Meiburg</i> Chair: Kaoru Maruta								
9:00	BREAK / Exhibition								9:00
9:20	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	9:20
			OS1&OS3: The Ninth International Symposium on Innovative Energy Research I & III <i>Chair: J. Ishimoto</i>	OS7: Smart Fluids & Soft Matters and Their Advanced Applications <i>Chair: M. Nakano</i>		OS13: Flow Realization, Measurement and Visualization <i>Chair: T. Yamagata</i>	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
			9:20-9:40 OS1/3-1 Magnetic Properties Of FeSIB For Sensing Application <i>G. Diguat, K. Makabe, J. Froemel, H. Kurita, F. Narita, M. Muroyama</i> 9:40-10:00 OS1/3-2 Study on the Utilization of Middle-level Geothermal Energy based on Non-isothermal Pipeline Flow <i>Z. Luo, Z. Ma</i> 10:00-10:20 OS1/3-3 Prediction Model for Liquid Sheet Transversal Oscillation <i>I. Oshima, A. Sou</i> 10:20-10:40 OS1/3-4 Computation and Experiment on Flow around a Rectangular Plate Moving near Ground <i>Y. Kichise, Y. Seki, T. Noguchi, K. Hirata</i>	9:20-9:50 OS7-1 <i>Invited</i> Disassembling Blood Cots and Improving Blood Oxygenation With Magnetorheology For Covid-19 Patients <i>R. Tao</i> 9:50-10:10 OS7-2 A New Type of Artificial Muscle with Fast Response Characteristics <i>S. Sun, J. Yang, M. Nakano, R. Chang, W. Li</i> 10:10-10:30 OS7-3 3D Printing-assistant Method for Magneto-active Pulse Pump <i>X. Cao, X. Gong</i> 10:30-10:50 OS7-4 Motion of a Soft Dumbbell Microswimmer in Oscillating Shear Flow and Random Linear Flow <i>A. Doi, T. Omori, T. Ishikawa</i>		9:20-9:35 OS13-1 Comparison of Three-dimensional Density Field of Numerical and Experimental Analysis for Twin Jets <i>C. Lee, Y. Ozawa, T. Haga, T. Nonomura, K. Asai</i> 9:35-9:50 OS13-2 Experimental Study of Axisymmetric Supersonic Microjets by TGI <i>T. Tashiro, S. Nakao, Y. Miyazato, Y. Ishino</i> 9:50-10:05 OS13-3 Study of Square Underexpanded Microjets <i>T. Sakanashi, S. Nakao, Y. Miyazato, Y. Ishino</i> 10:05-10:20 OS13-4 Study of Underexpanded Free Jets <i>R. Fukunaga, S. Nakao, Y. Miyazato</i> 10:20-10:35 OS13-5 Supersonic Jet Flow Reconstruction By Optimized Sparse Sensors Based On Sensor Selection Method <i>N. Twari, Y. Ozawa, T. Nonomura</i>		Short Oral Presentation (YouTube)	
10:50	BREAK / Exhibition								10:50
11:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	11:10
			GS: General Session Heat transfer <i>Chair: J. Okajima</i>	OS7: Smart Fluids & Soft Matters and Their Advanced Applications <i>Chair: R. Tao</i>		OS13: Flow Realization, Measurement and Visualization <i>Chair: K. Funamoto</i>	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics	
			11:10-11:30 GS1-1 Measurement of Temperature and Pressure Inside a Heat Pipe Equipped with Electrowetting Technique <i>K. Suzuki, M. Nakahata, K. Yoshida, N. Ono</i> 11:30-11:50 GS1-2 Effect of Evaporator Preheating on Startup Behavior of Capillary Pumped Loop <i>M. Hirata, K. Odagiri, H. Ogawa</i>	11:10-11:40 OS7-5 <i>Invited</i> Sensing Capabilities of Hybrid Liquid-Metal Magnetorheological Composites <i>Q. Zhang, G. Yun, S.-Y. Tang, W. Li</i> 11:40-12:00 OS7-6 Optimization of 3D Printing Flexible Ferromagnetic Composites With the Magnetophoresis Assistant <i>Z. Xiang, M. Q. Le, B. Duchame, V.-C. Nguyen</i>		11:10-11:25 OS13-6 Flow Characteristic of Cavitating Jet from a Small Orifice <i>K. Terakawa, S. Iio, K. Takamura, T. Uchiyama</i> 11:25-11:40 OS13-7 Quantitative OH Concentration Measurement on Calibration Flat Flame Using Bi-directional OH(2,0) LIF <i>Y. Higuchi, Y. Nunome, S. Tomioka, T. Tomita, T. Kudo, A. Hayakawa, H. Kobayashi</i>		Short Oral Presentation (YouTube)	

12:40	ROOM 1 12:40- Exhibitor Presentation Session Nobby Tech. Ltd.	11:50-12:10 GS1-3 A Study on Cooling of Heat Generated by Applying Electromagnetic Pressure in a Manufacturing Process of Metal Thin Plate <i>T. Ideguchi, T. Machida, Y. Ito, R. Yonekura, N. Ono</i> 12:10-12:30 GS1-4 A Potential of Temperature Distribution Control using Near-infrared Laser Irradiation and Gold Nanorods <i>A. Obonai, Y. Kanda, A. Komiya</i>	12:00-12:20 OS7-7 A Flexible Viscoelastic Coupling Cable with Self-Adapted Electrical Properties and Anti-Impact Performance toward Shapeable Electronic Devices <i>F. Yuan, X. Gong</i> 12:20-12:40 OS7-8 MagnetoRheological Foams for Energy Harvesting <i>G. Diquet, G. Sebald, M. Nakano, M. Lallart, J.Y. Cavaille</i>		11:40-11:55 OS13-8 Visualization Measurement of Aerosol Generated from Ultrasonic Scaler <i>K. Kato, T. Yamagata, N. Takahashi, S. Mineo, K. Tabeta</i> 11:55-12:10 OS13-9 Bubble induced Puffing Process of Fermenting Bread Dough <i>K. Kimura, K. Kikuchi, A. Srivastava, K. Numayama-Tsuruta, T. Ishikawa</i> 12:10-12:25 OS13-10 Effect of Density of a Sphere Launched Vertically in Water on the Sphere Dynamics <i>K. Takamura, T. Uchiyama</i>			12:40	
BREAK / Exhibiton									
13:30	ROOM 1	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	13:30	
<p style="text-align: center;">"JSPS Core-to-Core - NH₃ combustion & materials - IFS Lyon Center" collaborative session</p> <p>OS23: JSPS Core to Core program workshop & OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum & OS2: Ninth Int. Symp. Innov. Energ. II: Combustion Tech. & Fundamentals <i>Chair: T. Tokumasu</i></p>									
13:30-13:45	<p>Opening and Introduction of the Core to Core program Kaoru Maruta, Takashi Tokumasu (Tohoku University, Japan)</p> <p>13:45-14:25 OS23-1 Introduction of Each Base - Institute of Fluid Science, Tohoku University, Japan : Kaoru Maruta - King Abdullah University of Science and Technology, Saudi Arabia : Mani Sarathy - University of Lyon, France : Nicolas Mary - University of Washington, U.S.A : Fumio S Ohuchi</p> <p>14:25-14:45 OS23-2 <i>Invited</i> What's Next for Machine Learning: Specialized AI Application In Research <i>Y. L. Huang</i></p> <p>14:45-15:00 OS22-1/OS23-3 Local Stabilization Dynamics of a Methane/ammonia Non-premixed Jet Flame Up to Liftoff <i>S. Colson, M. Kuhn, A. Hayakawa, H. Kobayashi, C. Galizzi, D. Escudie</i></p>	<p>13:30-13:50 GS1-5 Investigation of Evaporation Behavior and Estimation of Drying Rate in Drying Process for Producing Coating Material <i>T. Ong, Y. Asanuma, K. Sato, N. Ono</i></p> <p>13:50-14:10 GS1-6 Temperature-sensitive Paint Measurements On Microchannel Flow With Side Wall Heating <i>P.-J. Tsai, Y.-C. Fan, T.-M. Liou, C.-Y. Huang</i></p> <p>14:10-14:30 GS1-7 Numerical Analysis of Two-Phase Mechanically Pumped Fluid Loop for Thermal Control of Electric Aircraft Motors <i>X. Chang, K. Fujita, H. Nagai</i></p>	<p>OS7: Smart Fluids & Soft Matters and Their Advanced Applications <i>Chair: G. Sebald</i></p> <p>13:30-14:00 OS7-9 <i>Invited</i> Smart Shear Stiffening Material: Rate-dependent Mechanical Properties, Mechanism and Practical Applications <i>X. Gong</i></p> <p>14:00-14:20 OS7-10 Synthesis and Characterisation of Magneto-rheological Shear Thickening Fluids <i>T. Tian, V. Sokolovski, W. Li, J. Ding</i></p> <p>14:20-14:40 OS7-11 Conductive Shear Thickening gel/Kevlar Wearable Fabrics: A Flexible Body Armor with Mechano-Electric Coupling Ballistic Performance <i>C. Zhao, S. Xuan, X. Gong</i></p> <p>14:40-15:00 OS7-12 Molecular Simulations of Neat and Aqueous Polyelectrolytes Having Low Molecular Weights <i>P. A. Bonnard, H. Ushiyama, S. Tejima, J. Fujita</i></p>		<p>OS13: Flow Realization, Measurement and Visualization <i>Chair: S. Funatani</i></p> <p>13:30-13:45 OS13-11 Design Parameters of the Nozzle for a Submerged Impulse Hydro Turbine <i>S. Ong Hui Sze, T. Saito, S. Iio, D. Tsumashima</i></p> <p>13:45-14:00 OS13-12 Performance and Strength of Propeller Turbine Runner with Outer Ring <i>T. Sawada, R. Morii, S. Iio</i></p> <p>14:00-14:15 OS13-13 Pressure Fluctuation Generated at Overlapping Area of Nozzle Tip and Blade Gap in a Cross-flow Turbine <i>M. Fujimori, T. Tanaka, K. Otsuka, S. Iio</i></p> <p>14:15-14:30 OS13-14 Flow and Performance Characteristics of a Small Propeller Turbine with Outer Ring Under Various Operating Conditions <i>R. Morii, T. Sawada, S. Iio</i></p> <p>14:30-14:45 OS13-15 Flow Investigation in a Cross-flow Turbine for Partial Load Operation <i>Y. Hayahashi, N. Ogawa, T. Kamijo, S. Iio, T. Kitahara, Y.-D. Choi, M. Imagaki</i></p> <p>14:45-15:00 OS13-16 Performance of a Waterfall-type Cross-flow Hydraulic Turbine <i>T. Wang, H. Shikama, T. Yamagata, N. Fujisawa</i></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p> <p style="text-align: center;">Poster Session OS20-1 ~ OS20-23 (Remo)</p>	15:00	
BREAK / Exhibition									

15:20	ROOM 1	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	15:20	
	<p>"JSPS Core-to-Core - NH₃ combustion & materials - IFS Lyon Center" collaborative session OS23: JSPS Core to Core program workshop & OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum & OS2: Ninth Int. Symp. Innov. Energ. II: Combustion Tech. & Fundamentals Chair: <u>H. Nakamura</u></p>	<p>GS: General Session Periodic flow, oscillatory flow Chair: <u>A. Yakeno</u></p>	<p>OS7: Smart Fluids & Soft Matters and Their Advanced Applications Chair: <u>X. Gong</u></p>		<p>OS13: Flow Realization, Measurement and Visualization Chair: <u>S. Ito</u></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>		
	<p>15:20-15:50 OS23-4 Invited Ammonia Direct Combustion <u>H. Kobayashi</u></p> <p>15:50-16:10 OS23-5 Invited Quantitative Measurements in Ammonia-Hydrogen Turbulent Jet Flames at Elevated Pressure <u>G. Wang, H. Tang, C. Yang, G. Magnotti, W. L. Roberts, T. F. Guiberti</u></p> <p>16:10-16:30 OS23-6 Invited Experimental Characterisation of the Reactive Properties of Premixed Ammonia Flames <u>A. Karan, G. Dayma, C. Chauveau, E. Halter</u></p> <p>16:30-16:50 OS2-1/OS23-7 Effects of Combustor Wall Cooling on Liquid Ammonia Spray Combustion in a Micro Gas Turbine Combustor <u>E. C. Okafor, O. Kurata, H. Yamashita, T. Inoue, T. Tsujimura, N. Iki, A. Hayakawa, M. Uchida, S. Ito, H. Kobayashi</u></p>	<p>15:20-15:40 GS1-9 Influence of Pitching Amplitude and Phase Difference between Periodic Flow and Pitching Wing on Thrust and Lift Coefficients <u>Y. Isoda, Y. Tanaka, S. Murata</u></p> <p>15:40-16:00 GS1-10 Influence of Phase Difference between Periodic Flow and Oscillating Wing on Maneuverability of a Robotic Fish <u>M. Kawano, Y. Tanaka, S. Murata</u></p> <p>16:00-16:20 GS1-12 Suppression of Artificial Viscosity Induced Post-Shock Oscillations in High-Order Spectral Difference Methods <u>G. Lodato, L. Vervisch, J.-B. Chapelier</u></p>	<p>15:20-15:50 OS7-13 Invited Development of Multi-disk Type Automotive Brake using Dry MR Fluid of TiO₂ Coated Cl Particles <u>M. Nakano, O. Taguchi, C. Sato, S. Sun</u></p> <p>15:50-16:10 OS7-14 Development and Characterization of Dry MR Fluid Rotary Damper with Variable Stiffness <u>J. Yang, S. Sun, O. Taguchi, M. Nakano</u></p> <p>16:10-16:30 OS7-15 Vibration Control of a Seat Suspension System using Variable Damping and Stiffness Magnetorheological Dampers <u>L. Deng, H. Du, S. Sun, W. Li</u></p> <p>16:30-16:50 OS7-16 The Influence of Squeeze on the Electrical Conductive and Mechanical Properties of Magnetorheological Fluid <u>X. Ruan, J. Zhao, H. Bian, X. Gong</u></p>		<p>15:20-15:35 OS13-17 Improvement of Power Generation Efficiency of Self-powered IoT Turbine Flowmeter with NACA airfoil Shaped Blades and Central Axis Cone <u>Y. Sakamoto, T. Uchiyama, K. Takamura, H. Nakayama</u></p> <p>15:35-15:50 OS13-18 Experiment on Fluid Force and Wake Characteristics of Basic Airfoils at Very-Low Reynolds Numbers <u>K. Hamaguchi, R. Takata, T. Uchida, K. Sugitani, H. Tamigawa, T. Noguchi, K. Hirata</u></p> <p>15:50-16:05 OS13-19 Experimental Study of Vortex Shedding from a Sphere with a Uniaxial Through-hole in Uniform Flow <u>H. Kato, K. Takamura, T. Uchiyama</u></p> <p>16:05-16:20 OS13-20 Study on Unsteady Flow Characteristics in Transonic Diffusers <u>T. Naka, S. Nakao, Y. Miyazato</u></p> <p>16:20-16:35 OS13-21 The Simultaneous Visualization of Flow and Temperature inside a Pulsating Heat Pipe Using Temperature-sensitive Paint <u>Y. Otake, K. Ishii, K. Fumoto</u></p>			<p>Poster Session OS20-24 ~ OS20-46 (Remo)</p>	
16:50	BREAK / Exhibition							16:50	
17:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	17:10
	<p>OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum 1 Chairs: <u>L. Joly-Pottuz, T. Uchimoto</u></p>	<p>OS2: The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals Ammonia combustion Chair: <u>E. C. Okafor</u></p>	<p>OS18: Flow dynamics of diffusion-reactive and phase transition systems Chair: <u>J. Okajima</u></p>	<p>OS7: Smart Fluids & Soft Matters and Their Advanced Applications Chair: <u>W. Li</u></p>	<p>OS14: Porous Media Chairs: <u>M. Ohta, A. Suzuki</u></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>		
	<p>17:10-17:30 OS22-2 Microstructure and Mechanical Properties of An Al-TiC Metal Matrix Composite Obtained by Reactive Synthesis <u>H. Kuriita, S. Takeda, O. Dezellus, T. Uchimoto, F. Narita</u></p> <p>17:30-17:50 OS22-3 Effect of Flow-Focusing Channel Geometry on Field-Assisted Alignment of Cellulose Nanofibrils <u>H. Takana, S. Fukumori</u></p>	<p>17:10-17:30 OS2-2 Direct Numerical Simulation of Ammonia Evaporating Spray Jet at Different Environmental Pre-heating Condition <u>L. Angelilli, P.P. Ciottoli, F. Hernandez Perez, M. Valorani, H. Im</u></p> <p>17:30-17:50 OS2-3 Liquid Ammonia Spray Characteristics Using a Hollow Cone Nozzle at Various Ambient Pressures <u>K.D.K.A. Samarathne, H. Yamashita, S. Colson, A. Hayakawa, H. Kobayashi</u></p>	<p>17:10-17:40 OS18-1 Invited Interaction of Thermal Radiation and Natural Convection <u>T. Kogawa</u></p> <p>17:40-18:00 OS18-2 Numerical Simulations of Jet Formation Induced by Gas Bubble Collapse Near the Micro Fiber Immersed in a Liquid <u>R. Fursenko, V. Chudnovskii, S. Minaev, J. Okajima</u></p>	<p>17:10-17:40 OS7-17 Invited Elastocaloric Cooling Using Natural Rubber: Material Properties, Heat Transfer and Heat Losses Effects on Proof of Concept Performances <u>G. Sebald, G. Lombardi, L. Maury, J. Jay, A. Komiya, X. S. Way, G. Coativy, H. Haissoune, L. Lebrun</u></p>	<p>17:10-17:25 OS14-1 Invited Dual-Stent Microstructural Characteristics and their Impact on Intra-Aneurysmal Haemodynamics <u>S. Tupin, M. Zhang, Y. Li, M. Ohta</u></p> <p>17:25-17:40 OS14-2 3D Printing-based Microfluidics for Geosciences <u>A. Patsoukis Dimou, A. Suzuki, H. Menke, J. Maes, S. Geiger</u></p> <p>17:40-17:55 OS14-3 A Numerical Study of Reactive Radial Viscous Fingering <u>P. Verma, V. Sharma, M. Mishra</u></p>			<p>Short Oral Presentation (YouTube)</p>	

<p>17:50-18:10 OS22-4 Methodology to Detect Water Uptake in Polymer Materials Using Non-Contact Capacitor Sensor <i>L. Ollivier-Lamarque, T. Uchimoto, M. Mary, S. Marcelin, S. Livi</i></p> <p>18:10-18:30 OS22-5 MAGIC: Magnetic AGing in ferromagnetic <i>B. Ducharme, L. Model, M.-A. Raulet, R. Saoudi, T. Uchimoto</i></p>	<p>17:50-18:10 OS2-4 Investigations of Oxidation and Reactivity of Dimethyl Ether/Ammonia Mixtures by a Micro Flow Reactor with a Controlled Temperature Profile <i>Y. Murakami, H. Nakamura, T. Tezuka, K. Hiraoka, K. Maruta</i></p> <p>18:10-18:30 OS2-5 Effects of H₂O Diluents on Ammonia Oxidation Examined by a Micro Flow Reactor with a Controlled Temperature Profile <i>K. Tamaaki, Y. Murakami, K. Kanayama, T. Tezuka, H. Nakamura</i></p>	<p>18:00-18:20 OS18-3 Hydrogen Diffusion after the Sodium-Water Reaction <i>A. Suzuki, M. Miyano, R. Miura</i></p> <p>18:20-18:40 OS18-4 Diffusive-Thermal Oscillations of Burner Stabilized CH₄ Flames as a Tool to Kinetics Verification <i>V. Gubernov, V. Mislavskii, V. Bykov, U. Maas</i></p>	<p>17:40-18:00 OS7-18 Microscopic Mechanical Behavior of Physically Cross-linked Flexible Elastomers <i>R. Zhao, Y. Wang, S. Wang, C. Zhao, X. Gong</i></p>	<p>17:55-18:10 OS14-4 Mass Transport in a Packed Suspension of Swimming Microorganisms <i>Y. Kogure, T. Omori, T. Ishikawa</i></p> <p>18:10-18:25 OS14-5 Topological Data Analysis for Mass Tracer Transport in Fracture Networks <i>K. Goto, A. Suzuki, J. Minto, T. Ito</i></p> <p>18:25-18:40 OS14-6 Numerical Simulation of Permeability Development along Closed Fracture by Methane Hydrate Dissociation <i>R. Zhang, T. Ito, T. Komai, Y. Sakamoto, N. Tenma</i></p>					
18:40 BREAK / Exhibition 18:40									
19:00	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	19:00
		<p>OS2: The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals Ignition and flame dynamics <i>Chair: A. K. Dubey</i></p>					<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>		
	<p>18:40-19:00 OS2-6 Effects of Strain Rates on Minimum Ignition Energy in a Premixed Counterflow <i>S. Xie, Z. Chen</i></p> <p>19:00-19:20 OS2-7 Numerical Analysis of Flame Behavior Initiated from Flame Ball in Counterflow Field <i>K. Sagawa, T. Akiba, Y. Morii, H. Nakamura, K. Maruta</i></p> <p>19:20-19:40 OS2-8 Effects of Turbulence and Lewis Number on the MIE Transition Phenomena <i>Y. Hirano, T. Mukoyama, T. Tezuka, Y. Morii, H. Nakamura, K. Maruta</i></p>						<p>Short Oral Presentation (YouTube)</p>		
20:00								20:00	

<p>8:00 Live Event 8:00</p> <p style="text-align: center;">9:00-9:05 Opening Address 9:10-11:00 Plenary Lectures</p> <p style="text-align: center;">9:10-10:00 "Development of high performance PEM fuel cells." <i>Chung-Jen Tseng</i> Chair: Jun Ishimoto</p> <p style="text-align: center;">10:10-11:00 "Come up with the Reasons for Confidence, and Inspiration arises" <i>Jun'ichiro Kawaguchi</i> Chair: Shigeru Obayashi</p>								
<p>11:00 BREAK 11:00</p>								
ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9
		<p>GS: General Session Flow control Chair: <i>M. Hirota</i></p>	<p>OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition Fuels, Engines, and Systems Chair: <i>T. Shimada</i></p>	<p>OS10: Biomolecular Dynamics Chairs: <i>M. Ohta, K. Echuya, Y. Mukai</i></p>	<p>OS15: Turbulence: from Fundamentals to Applications Noise & modeling Chair: <i>Y. Hattori</i></p>		<p>OS21: Fluids Science Research Award Lecturers (AFI-2021) Chair: <i>K. Maruta</i></p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>
		<p>11:10-11:30 GS1-13 High-Speed Schlieren Visualization of Two Jets Flapping in Anti-Phase at High Frequency <i>T. Shoji, T. Handa</i></p> <p>11:30-11:50 GS1-14 Experimental Study on Pressure-Ratio Dependence of High-Frequency Flapping Jets <i>S. Yuura, T. Handa</i></p> <p>11:50-12:10 GS1-15 Suppression of Thermoacoustic Oscillations in a Sondhauss Tube Using Genetic Programming <i>B. Yin, Y. Guan, S. Redonnet, V. Gupta, L. K. B. Li</i></p> <p>12:10-12:30 GS1-16 Ruelle-Takens-Newhouse Route to Chaos in a Forced Low-density Jet <i>Z. Yang, Y. Guan, S. Redonnet, Y. Zhu, V. Gupta, L. K. B. Li</i></p>	<p>11:10-11:40 OS4-1 Biomass Fuelization of WAX-based Solid Fuels for Hybrid Rockets by Cellulose Addition <i>Y. Nishimura, A. Takahashi, K. Takahashi</i></p> <p>11:40-12:10 OS4-2 Thrust Modulation Characteristics of Hybrid Rocket Engine for VTVL System <i>D. Chae, C. Lee</i></p>	<p>11:10-11:40 OS10-1 <i>Invited</i> Biological Responses on a Surface-Modified Nitinol Alloy through the Anodization Technique <i>N. Ohtsu, H. Tantho, K. Tate, Z. Wang, M. Ohta</i></p> <p>11:40-12:05 OS10-2 <i>Invited</i> Dynamics of Water Molecules around the DNA Lesions <i>A. Suzuki, M. Miyano, R. Miura, M. Yasui</i></p> <p>12:05-12:25 OS10-3 <i>Invited</i> Sugar Type Discrimination of Protein Sugar Modification based on Subcellular Localization <i>K. Echuya, M. Doi, Y. Mukai</i></p> <p>12:25-12:40 OS10-4 Function of Gluex to ion transportation in CLC^F/H^+ Antiporters <i>A. Nakamura, T. Tokamasu, T. Mabuchi</i></p>	<p>11:10-11:30 OS15-1 Effect of Plate Trailing Edge Deformations on Jet Flow and Noise: An LES Investigation <i>C. Horner, A. Sescu, M. Z. Afsar, E. Collins</i></p> <p>11:30-11:50 OS15-2 Numerical Simulations of the Performance of a Twin Screws Expander <i>J.-W. Yeh, C. C. Tsao, K.-Y. Lai, Y.-C. Li, S. Yavuzkurt, Y.-H. Liu</i></p> <p>11:50-12:10 OS15-3 Searching for Subgrid-Scale model for Burgers Equation Using Neural Network <i>G. Tube Jammaat, Y. Hattori</i></p>		<p>11:10-11:40 FRA-1 Self-similar solution of strongly charge-separated two-fluids plasma expansion into vacuum and the prominent applications <i>M. Murakami</i></p> <p>11:40-12:10 FRA-2 Microscale Combustion and Fuel-powered Micro Energy Source <i>Y. Suzuki</i></p>	<p>Poster Session OS20-47 ~ OS20-71 (Remo)</p>
ROOM 1								
12:40- Exhibitor Presentation Session Nobby Tech. Ltd.	<p>12:40 BREAK 12:40</p>							

ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9
	OS2: The Ninth International Symposium on Innovative Energy Research II: Combustion Technology and Fundamentals Microchannel combustion Chair: Y. Marukami	GS: General Session Flow measurement, flow visualization Chair: K. Fujita	OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition Fuels, Engines, and Systems Chair: T. Shimada		OS15: Turbulence: from Fundamentals to Applications structures & mixing Chair: Y. Tsuji	OS17: Supercritical Fluid Chair: Y. Kanda	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics
	13:30-13:50 OS2-9 FREE with a Separated Stable Cool Flame in a Micro Flow Reactor with a Controlled Temperature Profile <u>K. Akita</u> , Y. Morii, H. Nakamura, T. Tezuka, K. Maruta 13:50-14:10 OS2-10 Species Measurement for Studying Oxidation and Pyrolysis of Dimethyl Carbonate and Diethyl Carbonate using a Micro Flow Reactor with a Controlled Temperature Profile <u>K. Kanayama</u> , S. Takahashi, S. Morikura, H. Nakamura, T. Tezuka, K. Maruta 14:10-14:30 OS2-11 Experiments and Kinetics for Oxidation and Pyrolysis of Ethyl Methyl Carbonate examined by a Micro Flow Reactor with a Controlled Temperature Profile <u>S. Takahashi</u> , K. Kanayama, S. Morikura, H. Nakamura, Te. Tezuka, K. Maruta 14:30-14:50 OS2-12 Numerical Investigation Of CH ₄ /H ₂ /Air Flame Bifurcation In A Microchannel With A Controlled Wall Temperature Profile <u>S. Wang</u> , A. Fan	13:30-13:50 GS1-17 Experimental Study on the Characteristics of FLEET Emission in Air <u>W. Yamaguchi</u> , T. Yanase, J. Ishihara, A. Nakatani, T. Handa, Y. Sugioka, S. Koike 13:50-14:10 GS1-18 Behavior and Aerodynamic Characteristics of Self-Oscillating Elastic Flat Plate in the Flow <u>T. Kagawa</u> , A. Urita, T. Handa 14:10-14:30 GS1-19 Flow Field and Drag Coefficient Analysis of The Feather Shuttlecock's Permutation <u>W.-C. Chen</u> , M.-K. Wu, S.-W. Chen, C.-Y. Huang 14:30-14:50 GS1-20 Sample Tests of PSP/TSP Using Machinable Ceramics and Prepolymer <u>S. Matsubara</u> , N. Fujimatsu	14:00-14:30 OS4-3 Hybrid Rockets as Post-Boost Stages and Kick Motors <u>L. Kamps</u> , S. Hirai, H. Nagata 14:30-15:00 OS4-4 Design and Burning Test of LOX Regenerative-cooling Nozzle for SOFT Hybrid Rocket Engine <u>T. Sakurai</u> , K. Kurachi, R. Matsumoto, H. Ozeki		13:40-14:00 OS15-4 Temporal Behavior of Significant Shear Layers in High Reynolds Number Turbulence <u>T. Ishihara</u> 14:00-14:20 OS15-5 Large-scale Clustering in Particle-Laden Homogeneous Isotropic Turbulence <u>K. Matsuda</u> , K. Schneider, K. Yoshimatsu 14:20-14:40 OS15-6 Spectra of Supersaturation and Liquid Water Content in Cloud Turbulence <u>T. Gotoh</u> , I. Saito, T. Watanabe 14:40-15:00 OS15-7 Numerical Investigation about Inverse Cascade Phenomenon in Mixing Layer <u>M. Wang</u> , Y. Ito, T. Okawa, K. Iwano, Y. Sakai	13:30-14:10 OS17-1 <i>Invited</i> Physics of Fluids Near the Critical Point: Critical Phenomena under Gravity <u>L. Chen</u> 14:10-14:30 OS17-2 Numerical Investigation of Convection Heat Transfer of Supercritical CO ₂ in Porous Media: The Effect of Porous Structure <u>Y. Feng</u> , L. Chen, Y. Kanda, A. Komiya 14:30-14:50 OS17-3 Investigation on High Temperature Thermal Storage System Based on Phase Change Material Using Supercritical CO ₂ as Heat Transfer Fluid <u>J. Chen</u> , L. Chen	Free Discussion 1 (CRF-1 to 15) (Remo)	Short Oral Presentation (YouTube)
BREAK / Exhibition								
	OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum 2 Chairs: J.-Y. Cavaille, H. Takana	OS18: Flow dynamics of diffusion-reactive and phase transition systems Chair: R. Fursenko	OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition Fuels, Engines, and Systems / Chair: T. Shimada Internal Ballistics / Chair: K. Sawada		OS15: Turbulence: from Fundamentals to Applications wall turbulence Chair: T. Ishihara	OS17: Supercritical Fluid Chair: Y. Feng	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics
15:30-15:50 OS22-6 Heusler Alloy Based Heat Engine with Pyroelectric Energy Conversion <u>M. Lallart</u> , H. Miki, L. Yan, G. Sebald, G. Diguët, M. Ohtsuka, M. Kohl 15:50-16:10 OS22-7 In-Flight Thermal Gradient of Polymer Particles During Cold Spray Process <u>C. Bernard</u> , H. Takana, G. Diguët, O. Lame, J.-Y. Cavaille, K. Ogawa	15:20-15:40 OS2-13 Experimental Observation of Acoustic Parametric Instability in a Thermo-diffusively Unstable Mixture <u>A. K. Dubey</u> , T. Tezuka, Y. Morii, H. Nakamura, K. Maruta 15:40-16:10 OS2-14 <i>Invited talk</i> Revisiting the Stability of One-Dimensional Gaseous Detonations <u>H. Tojaili</u> , G. Lodato, L. Vervisch, P. Clavin	15:50-16:10 OS18-5 Propagation of Hot Liquid Jet Inside the Finite Volume Under Local Laser Heating <u>S. Mokrin</u> , D. Tereshko, A. Kulik, A. Kraevskii, V. Chudnovskii 16:10-16:30 OS18-6 Numerical Simulations of the Flame Front Dynamics by Particles Method within G-equation <u>O. Bryzgalov</u> , S. Minaev 16:30-16:50 OS18-7 Effects of Chemical Reaction on Interfacial Instability of Miscible Fluid Flow in a Channel <u>S. N. Maharana</u> , M. Mishra	15:20-15:50 OS4-5 Visualization of Liquefied Paraffin Wax in Hybrid Rocket Post-Chamber <u>W. Hyun</u> , C. Lee 15:50-16:20 OS4-6 Numerical Analysis of Combustion Chamber Flow in a Hybrid Rocket Two-dimensional Combustor Using the TCUP Method <u>A. Takeshita</u> , T. Shimada 16:20-16:50 OS4-7 Evaluation of the Speed of Sound in Hybrid Rocket <u>M. Sicut</u> , T. Shimada, C. Carmicino		15:20-15:40 OS15-8 Experimental Study on Turbulent Boundary Layer over Compliant Wall <u>K. Kori</u> , N. Fujimatsu 15:40-16:00 OS15-9 Scaling of Turbulence Statistics in Adverse-Pressure-Gradient Turbulent Boundary Layer Flow <u>A. Sekimoto</u> , V. Kitsios, C. Atkinson, J. Soria 16:00-16:20 OS15-10 Comparison of Experimental Results and DNS for Secondary Instability in Turbulent Boundary Layer <u>T. Kikugawa</u> , K. Tsuboko, A. Ozeki, K. Shigeeda, M. Matsubara	15:20-15:40 OS17-4 Numerical Simulation of Turbulent Mixing Flow in Supercritical Hydrothermal Synthesis Reactors <u>K. Matsui</u> , S. Yatsuyanagi, T. Furusawa, A. Yoko, S. Yamamoto, T. Adschiri 15:40-16:00 OS17-5 Concentration Gradient when the Liquid-like and Gas-like States Coexist under Supercritical Pressure <u>Z.-C. Hu</u>	Free Discussion 2 (CRF-16 to 30, except for CRF-20) (Remo)	Short Oral Presentation (YouTube)

16:10-16:30 OS22-8 Multiscale Simulation of Carbon Electromigration in Iron <u>K. Kita</u> , T. Mabuchi, S. Molina-Montoya, C. Adessi, P. Chantrenne, T. Tokumasu	16:10-16:30 OS2-15 DNS of Reactive Compressible Flow for Detailed Understanding of Knocking Phenomena <u>Y. Mori</u> , A. K. Dubey, K. Akita, H. Nakamura, K. Maruta			16:20-16:40 OS15-11 LDV Measurement Issues for High Reynolds Number Turbulent Pipe Flow <u>M. Ono</u> , N. Furuiichi, N. Kurihara, Y. Wada, Y. Tsuji	16:00-16:20 OS17-6 Experimental Visualization of Transient Heat Transfer under Supercritical Conditions Near and Far from Critical Point on p - T diagram <u>H. Ito</u> , Y. Kanda, L. Chen, A. Komiya		
16:30-16:50 OS22-9 Experimental Evaluation of the Relationship between Pore Patterning and Protein Hindered Diffusion <u>A. Komiya</u> , R. Zhu, J. F. Torres, Y. Kanda, S. Livi	16:30-16:50 OS2-16 Uncertainty Quantification Analysis of RANS of Spray Swirling Jets <u>J. Liberatori</u> , A. Petrocchi, R. M. Galassi, H. G. Im, M. Valorani, P. P. Ciottoli				16:20-16:40 OS17-7 Analysis of sCO ₂ Statistical Fluctuation Properties via Molecular Dynamics Simulation <u>Z.-Y. Liu</u> , L. Chen		
BREAK							
BREAK							
ROOM 1	ROOM 2	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	ROOM 9
OS22: AFI-2021 IFS Lyon Center Collaborative Research Forum 3 <i>Chairs: C. Frindel, A. Yakeno</i>	Collaborative Session of OS2 and OS18 OS2: Ninth Int. Symp. Innov. Energ. II: Tech. & Fundamentals & OS18: Flow dynamics of diffusion-reactive and phase transition systems <i>Chair: V. Gubernov</i>	OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 13th Edition Internal Ballistics <i>Chair: K. Sawada</i>	OS9: Biomedical Flow Dynamics <i>Chairs: M. Ohta, M. Zhang</i>	OS15: Turbulence: from Fundamentals to Applications miscellaneous topics <i>Chair: Y. Hattori</i>	OS17: Supercritical Fluid <i>Chair: J. Chen</i>	OS21: IFS Collaborative Research Forum (AFI-2021)	OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics
17:10-17:30 OS22-10 Stability and Transition to Turbulence of Taylor Vortex in a Gap between Rotating Two Cones <u>T. Adachi</u> , W. Toshiharu, K. Akinaga, A. Komiya, D. Henry, V. Botton	17:10-17:30 OS2-17 Computational Study on Flame Balls at Fuel Lean and Rich Conditions <u>A. Tsumoda</u> , T. Akiba, H. Nakamura, T. Tezuka, K. Maruta	17:10-17:40 OS4-8 Review of CFD Simulations of the Internal Ballistics of Paraffin-fuelled Hybrid Rocket Engines at the University of Naples <u>G. Gallo</u> , C. Carmicino	17:10-17:50 OS9-1 <i>Invited</i> Challenge of CFD for Clinical Assessment of Intracranial Aneurysm <u>Y. Qian</u>	17:10-17:30 OS15-12 Analysis of Very Large-Scale Motion Estimated from Cross-sectional Distribution of Velocity Correlation in a Turbulent Channel Flow <u>K. Tsuboko</u> , Y. Tanada, T. Kikugawa, A. Ozeki, K. Shigeeda, M. Matsubara	17:10-17:30 OS17-8 Pore-Scale Modeling on Skin and Volume-Averaged Friction Factors in 3D Micromodel following Supercritical CO ₂ Invasion Nature <u>K. Ragui</u> , L. Chen, Y. Kanda, A. Komiya		Short Oral Presentation (YouTube)
17:30-17:50 OS22-11 Monte Carlo Studies on 3D Skyrmion Stability and Shape Deformation under Uniaxial Stress <u>H. Koibuchi</u> , S. Hongo, F. Kato, S. E. Hog, G. Diguët, T. Uchimoto, H. T. Diep	17:30-17:50 OS2-18 Counterflow Premixed Flame Experiments at ISS Kibo for Comprehensive Combustion Limit Theory <u>T. Akiba</u> , A. Tsumoda, H. Nakamura, T. Tezuka, M. Kikuchi, K. Maruta	17:40-18:10 OS4-9 Review on Internal Ballistics Research on Hybrid Rockets <u>T. Shimada</u>	17:50-18:30 OS9-2 <i>Invited</i> Structure Design and Finite Element Analysis of Patch in Intraventricular Tunnel <u>X. Li</u> , <u>A. Qiao</u>	17:30-17:50 OS15-13 Measurement of High Schmidt Number Scalar Mixing in Grid Generated Turbulence <u>K. Iwano</u> , M. Suzuki, Y. Sakai, Y. Ito	17:30-17:50 OS17-9 Numerical Study on Supercritical N-Dodecane Flows with Endothermic Pyrolysis Reaction <u>S. Yatsunagai</u> , T. Furusawa, S. Yamamoto, S. Tomioka, T. Onodera		
17:50-18:10 OS22-12 Mode Decomposition Method for Extracting Characteristic Structures Related to the Subsonic Jet Noise Generation <u>S. Morita</u> , A. Yakeno, C. Bogey, S. Obayashi	17:50-18:20 OS18-8 <i>Invited</i> Near Limit Flame Propagation in a Thin Layer Geometry at Low Peclet Numbers <u>M. Kuznetsov</u> , J. Yanez, F. Veiga-López	18:10-18:40 WRAP-UP <u>T. Shimada</u>		17:50-18:10 OS15-14 Trajectory Analysis of Particle Motions in Superfluid Helium-4 using PTV Method <u>L. Chen</u> , Y. Tsuji	17:50-18:10 OS17-10 Optimization of SFE Based Remediation Conditions for Metal and Metalloids in Soil at Pilot Scales: A Brief Summary Study <u>J. H. Hasanov</u> , L. Chen,		
18:10-18:30 OS22-13 Coupled Computing of Fluid-Structure Interaction Problems for Multiphase Energy Systems <u>J. Ishimoto</u> , T. Elguedj	18:20-18:40 OS18-9 The Normal Velocity of the Population Front in the "Predator-Prey" Model <u>E. Dats</u> , S. Minaev, V. Gubernov, J. Okajima			18:10-18:30 OS15-15 Under-expanded Exit Conditions in Supersonic Axisymmetric Jets Induce Large-scale Temporal 'Negative-loops' in High-order Turbulence Correlations <u>S. Sarrat</u> , <u>M. Afzar</u> , G. Camerlengo, J. Sesterhenn	18:10-18:30 OS17-11 Preliminary Investigation on the Boundary Convection Structures of Fluid under Thermo/Magnetic Mechanical Effects in Critical Region <u>A. Al Mahabouri</u> , L. Chen, Y. Iwamoto		
18:30-18:50 OS22-14 Modelling Self-Organization by Oxygen with Reaction-Diffusion Models <u>O. Cochet-Escartin</u> , M. Demircigil, S. Hirose, V. Calvez, K. Funamoto, C. Anjard, <u>J.-P. Rieu</u>							
BREAK							
ONLINE							
19:00-20:00 BANQUET							

8:00	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	8:00	
	<p>OS6: New Dimensions of Magnetic Suspension and Balance System <i>Chair: K. Asai</i></p>		<p>OS11: Microfluidics and Microphysiological Modeling <i>Chair: K. Funamoto</i></p>				<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>		
	<p>8:00-8:20 OS6-1 <i>Invited</i> Further Development of an Electromagnetic Position Sensor with Digital Processing <i>C. P. Britcher, M. E. Weinmann</i></p> <p>8:20-8:40 OS6-2 Position Sensing Method for Rotating Sphere in 1-m Magnetic Suspension and Balance System <i>H. Okuzumi, H. Sawada, Y. Konishi, S. Obayashi, K. Asai</i></p> <p>8:40-9:00 OS6-3 Blunt Body Pitch Damping Measurements from Multiple Subsonic Free-to-Pitch Magnetic Suspension Trials <i>M. Schoenenberger, D. Cox, C. Britcher</i></p>		<p>8:00-8:12 OS11-1 Dynamics of Pulsatile Viscous and Viscoelastic Fluid Slugs: Experiments. <i>P. Vazquez-Vergara, L. F. Olguin, E. Corvera Poiré</i></p> <p>8:12-8:24 OS11-2 Dynamics of Pulsatile Viscous and Viscoelastic Fluid Slugs: Theory <i>U. Torres-Herrera, L. F. Olguin, E. Corvera Poiré</i></p> <p>8:24-8:36 OS11-3 Fluid Dynamics Within An Oscillating Nanotube: Insights Into Nonlinear Dynamics <i>U. Torres-Herrera, L. E. Miranda, K. A. Fernández, E. Corvera Poiré</i></p> <p>8:36-8:48 OS11-4 Model of the Circulatory System of the Human Liver <i>A. M. Torres Rojas, S. Lorente, M. Hautefeuille, A. Sanchez Cedillo</i></p> <p>8:48-9:00 OS11-5 Emission of Droplets in a Zero-mean-flow Microfluidic Device: a Lattice-Boltzmann Study <i>J. Lombard, I. Pagonabarraga, E. Corvera Poiré</i></p>					<p>Free Discussion 3 (CRF-20, 48, 66, 67, 73, 86) (Remo)</p>	<p>Short Oral Presentation (YouTube)</p>	
9:00	BREAK / Exhibition								9:00	
9:20	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	9:20	
	<p>OS6: New Dimensions of Magnetic Suspension and Balance System <i>Chair: S. Obayashi</i></p>	<p>OS5: Advanced Applications of Multi-functional Fluids Plasma Chemistry <i>Chair: H Takana</i></p>	<p>GS: General Session Flow simulation, flow analysis <i>Chair: Y. Abe</i></p>	<p>OS8: Advanced Physical Stimuli and Biological Responses <i>Chair: S. Kawano</i></p>	<p>IFS Tour</p>	<p>OS16: Vortex Motion boundary layer & vortex <i>Chair: Y. Hattori</i></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>		
	<p>9:20-9:38 OS6-4 Effect of Angle of Attack on Freestream-Aligned Circular Cylinder with Fineness Ratio of 1.0 - Update of Experimental Research in 0.3-m MSBS <i>S. Yokota, T. Nonomura, K. Asai</i></p> <p>9:38-9:56 OS6-5 Magnetic Levitation of Reentry Capsule Towards Wind Tunnel Testing <i>C. Inomata, S. Yokota, T. Nonomura, K. Asai</i></p> <p>9:56-10:14 OS6-6 CFD-based Feasibility Study of Pressure Reconstruction from PIV in MSBS <i>T. Nambu, S. Igarashi, Y. Ozawa, T. Nonomura, K. Asai</i></p>	<p>9:20-9:50 OS5-1 <i>Invited</i> Kinetics of Metastable and Atomic Species in Ns Pulse Discharge Plasmas in N₂-H₂ mixtures: Diagnostics and Modeling <i>X. Yang, E. R. Jans, C. J. Richards, S. Raskar, D. van den Bekerom, I. V. Adamovich</i></p> <p>9:50-10:10 OS5-2 Synthesis of Ammonia Using Atmospheric Pressure Fluidized Bed Plasma <i>K. Shimizu, T. Sato, S. Zen, N. Takeuchi</i></p>	<p>9:20-9:40 GS1-22 Assessment of Linearized Shock-cell Models for Axisymmetric Underexpanded jets by Rainbow Schlieren Deflectometry <i>M. M. Islam, R. Fukunaga, S. Nakao, Y. Miyazato</i></p> <p>9:40-10:00 GS1-23 Investigation of Unstable Disturbances in a Hypersonic Boundary Layer around Elliptic cone by Global Stability Analysis <i>S. Aokage, Y. Ogino</i></p>	<p>9:45-9:50 Opening <i>T. Sato, T. Ohashi</i></p> <p>9:50-10:20 OS8-1 <i>Invited</i> Kinetics and Hydrogen-bond States of Water Molecules in Protein Solutions and Biomaterials <i>R. Shirakashi</i></p> <p>10:20-10:35 OS8-2 Relationship Between Dielectric and Infrared Spectra of Water: Hydrogen Bond Strength and Rotational Relaxation Time in Saccharide Aqueous Solutions <i>J. Zhang, H. Matsuura, R. Shirakashi</i></p>	<p>9:20-10:20 IFS Tour</p>	<p>9:20-9:40 OS16-1 Control of Görtler Vortices in High-Speed Boundary Layer Flows Using Nonlinear Boundary Region Equations <i>Q. Es-Sahlí, A. Sescu, M. Z. Afsar, Y. Hattori, M. Hirota</i></p> <p>9:40-10:00 OS16-2 Numerical Study on Local Scale Similarity of Primary and Secondary Crossflow Instability <i>M. Hirota, Y. Ide, Y. Hattori</i></p> <p>10:00-10:20 OS16-3 Optimization of Turbulent Transition Delay Effect Using Dynamically Transforming Roughness Elements <i>T. Shirotsaki, M. Hirota, Y. Hattori</i></p>		<p>Short Oral Presentation (YouTube)</p>		

<p>10:14-10:32 OS6-7 Measurements of Aerodynamic Characteristics of Square-Cylinder Models with Low Fineness Ratio Using 1.0-m Magnetic Suspension and Balance System <i>R. Makino, Y. Wajima, M. Horiguchi, H. Okuzumi, K. Asai, S. Obayashi</i></p> <p>10:32-10:50 OS6-8 Aerodynamic Characteristics of the Slanted Cylinder Afterbody Investigated in 0.3-m Magnetic Suspension and Balance System <i>K. Tashiro, S. Yokota, F. Zigunov, Y. Ozawa, T. Nonomura, K. Asai</i></p>	<p>10:10-10:30 OS5-3 Gas-Phase Analysis by FTIR Spectrometry for Plasma with Dilute H₂SO₄ Solution <i>S. Deng, N. Takeuchi, J. Hieda, K. Takahashi, K. Tachibana, O. L. Li</i></p> <p>10:30-10:50 OS5-4 PIV Analysis of Plasma-induced Liquid Flows in Surfactant Solutions <i>T. Kawasaki, M. Kamasaki, N. Takeuchi, F. Mitsugi</i></p>	<p>10:00-10:20 GS1-24 Numerical Investigation on Water Entry of Simple Geometry Using a CIP Method <i>Y. Sugiura, N. Fujimatsu</i></p>	<p>10:35-10:50 OS8-3 Liposomal Drug Carriers through an Extended Skin <i>J. Huang, K. Kikuchi, K. Numayama-Tsuruta, T. Ishikawa</i></p>		<p>10:20-10:40 OS16-4 Characteristics of Inertial Waves on Axisymmetric Vortex <i>T. Abe, Y. Hattori</i></p>		
<p>10:50 BREAK / Exhibition</p>							
<p>11:10 ROOM 1</p>	<p>ROOM 2</p>	<p>ROOM 3</p>	<p>ROOM 4</p>	<p>ROOM 5</p>	<p>ROOM 6</p>	<p>ROOM 7</p>	<p>ROOM 8</p>
	<p>OS5: Advanced Applications of Multi-functional Fluids Non-equilibrium Plasma, Thermal Plasma <i>Chair: T. Fujino</i></p>	<p>GS: General Session Flow simulation, flow analysis <i>Chair: Y. Abe</i></p>	<p>OS8: Advanced Physical Stimuli and Biological Responses <i>Chair: Y.-C. Cheng</i></p>		<p>OS16: Vortex Motion vortex dynamics <i>Chair: M. Hirota</i></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>
	<p>11:10-11:30 OS5-5 Pre-ionized Inert Gas Plasma MHD Power Generation with Ne/Xe Working Gas <i>O. Kimsor, K. Itokawa, Y. Okuno</i></p> <p>11:30-11:50 OS5-6 Numerical Simulation and Optical Emission Spectrometry for Multiple Thermal Plasma Jet <i>J.-H. Oh, Y. H. Lee, H. Kang, T.-H. Kim, H. Takana, S. Choi</i></p> <p>11:50-12:10 OS5-7 Numerical Modelling of Wood Gasification in Thermal Plasma Reactor at Higher Plasma Flow Rates <i>I. Hirka, O. Živný, Jiří Jeništa</i></p> <p>12:10-12:30 OS5-8 Experimental and Numerical Investigation of Hollow Electrode Plasma Torch with Reversed Polarity Discharge Structure and Cylindrical Exit Nozzle <i>D. Figueroa-Michal, S.-M. Jeong, D.-H. Lee, M.-G. Choi, S.-Y. Yang, J. H. Seo</i></p>	<p>11:10-11:30 GS1-25 Unsteady Flows through Three-Stage Stator-Rotor Blade Rows in Intermediate-Pressure Steam Turbine with Various Blade Shapes <i>H. Miyazawa, S. Funahazama, T. Furusawa, S. Yamamoto</i></p> <p>11:30-11:50 GS1-26 Collective Behavior in a Network of Four Ring-coupled Turbulent Combustors <i>Y. Guan, K. Moon, K. T. Kim, L. K. B. Li</i></p>	<p>11:10-11:40 OS8-4 <i>Invited</i> Surface Acoustic Wave Microfluidic Platform for Cell Mechanical Measurement <i>Y. Wu, P.-VS. Lee, A. Stewart</i></p> <p>11:40-12:10 OS8-5 <i>Invited</i> A Microfluidic Particle Analyzer Device Based on Dual-Frequency Impedance Spectroscopy <i>T.-W. Wu, C.-H. Gao, C.-T. Lin</i></p> <p>12:10-12:25 OS8-6 Detection of Filopodia to Identify Leader Cells in Migration by Computer Vision <i>B. Otgon, G. Danaa, T. Ohashi</i></p> <p>12:25-12:40 OS8-7 Sustainable Particle Capture Ability on a Fresh-water Sponge <i>K. Kawashima, K. Kikuchi, T. Ishikawa</i></p>		<p>11:10-11:30 OS16-5 A Study of Velocity Structure of a Vortex in a Homogeneous Isotropic Turbulence <i>K. Nakayama</i></p> <p>11:30-11:50 OS16-6 Noether's Theorem, Relabeling Symmetry, Casimir Invariants, Generalized Bianchi Identity <i>Y. Fukumoto, R. Zou</i></p> <p>11:50-12:10 OS16-7 How Vortex Dynamics on the Corrugated Wing Works on the Aerodynamic Performance <i>Y. Fujita, M. Iima</i></p> <p>12:10-12:30 OS16-8 Observation of Quantum Vortex in Superfluid He4 <i>Y. Tsuji, C. Lizhu, N. Sakaki</i></p>	<p>Free Discussion 4 (CRF-31 to 50, except for CRF-43, 48) (Remo)</p>	<p>Short Oral Presentation (YouTube)</p>
<p>12:40 ROOM 1</p>	<p>12:40- Exhibitor Presentation Session Nobby Tech. Ltd.</p>						
<p>12:40 BREAK / Exhibition</p>							

13:30	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	13:30
		<p>OS5: Advanced Applications of Multi-functional Fluids Magnetic Fluid, MR Fluid <i>Chair: K. Doi</i></p>		<p>OS8: Advanced Physical Stimuli and Biological Responses <i>Chair: T. Sato</i></p>		<p>OS16: Vortex Motion acoustics <i>Chair: Y. Fukumoto</i></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>	
		<p>13:30-13:50 OS5-9 Development of a Backdrivable High-Torque Robot Arm with Magnetorheological Fluid Vane Motors <u>P. Zhang</u>, M. Kamezaki, R. Tsunoda, S. Sugano</p> <p>13:50-14:10 OS5-10 Torque Properties of a Rotary Elastomer Particle Damper Based on Spherical and Ellipsoidal Elastomer Particles <u>A. Rakhio</u>, Y. Ido, Y. Iwamoto, A. Toyouchi</p> <p>14:10-14:30 OS5-11 Numerical Investigation on Morphology of Magnetic Particles in Homogeneous Magnetic Fields <u>Y. Iwamoto</u>, T. Inden, Y. Ido, Y. Nakahara, E. Nagata</p> <p>14:30-14:50 OS5-12 Numerical Analysis of Self-driven Temperature-sensitive Magnetic Fluid between Partially Heated Parallel Plates under a Solenoidal Magnetic Field <u>Z. Rong</u>, Y. Iwamoto, Y. Ido</p>		<p>13:30-14:00 OS8-8 <i>Invited</i> Heterogeneous Integration of Microfluidic Chips with Solid-State IC and Optic Fiber Components for Flow and Viscosity Measurement <u>J.-J. Wang</u>, P.-Y. Ju, <u>C.-H. Lin</u></p> <p>14:00-14:30 OS8-9 <i>Invited</i> Label-Free Visualization of Intracellular Temperature by Using Water Raman Band <u>S. Kajimoto</u>, T. Nakabayashi</p> <p>14:30-14:45 OS8-10 Polarity Effects of Plasma-Induced Stimuli on Cell Viability <u>A. Nakayama</u>, H. Taguchi, C.-H. Chang, T. Nakajima, S. Liu, T. Sato</p> <p>14:45-15:00 OS8-11 Implantable Pressure Sensor Produced in Soft PDMS Capsule for Urinary Tract Obstruction Detection <u>Y.-J. Lin</u>, C.-H. Lin, Y.-S. Juan</p>		<p>13:30-14:10 OS16-9 <i>Invited</i> Numerical Study on Sounding Mechanism of Air-Jet Instruments with Compressible Fluid Simulation <u>K. Takahashi</u>, R. Tabata, S. Iwagami, S. Ikoga, R. Sumita, S. Takanami, T. Kobayashi, Y. Hattori</p> <p>14:10-14:30 OS16-10 Numerical Study of Note Transition with Fingering on a Woodwind Instrument <u>S. Takanami</u>, T. Kobayashi, K. Takahashi</p> <p>14:30-14:50 OS16-11 Numerical Analysis of Three-Dimensional Model of Flue Organ Pipe <u>S. Ikoga</u>, R. Tabata, S. Iwagami, T. Kobayashi, K. Takahashi</p> <p>14:50-15:10 OS16-12 The Effect of the Streamwise spatial Development of Reynolds Stress Auto-covariance Tensor on the Low-frequency Acoustic Spectrum of a High-speed Supersonic Air Jet <u>M. Afsar</u>, S. Stirrat, A. Sescu</p>	<p>Free Discussion 5 (CRF-51 to CRF-75, except for CRF-58, 60, 66, 67,73) (Remo)</p>	<p>Short Oral Presentation (YouTube)</p>	
15:00	BREAK / Exhibition								15:00
	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	
15:20		<p>OS5: Advanced Applications of Multi-functional Fluids EHD, Advanced Multi-phase flow <i>Chair: N. Takeuchi</i></p>	<p>OS11: Microfluidics and Microphysiological Modeling <i>Chair: T. Omori</i></p>	<p>OS8: Advanced Physical Stimuli and Biological Responses <i>Chair: T. Ohashi</i></p>	<p>OS9: Biomedical Flow Dynamics <i>Chairs: K. Takashima, H. Anzai</i></p>		<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>	15:20
		<p>15:20-15:40 OS5-13 Experimental Investigation of Thermo-Magnetic Pumps with Serial Connection <u>Y.-J. Li</u>, <u>J.-Y. Ji</u>, C.-Y. Huang</p> <p>15:40-16:00 OS5-14 Manipulation of Water Droplets by Dielectrophoresis <u>X. Guo</u>, S. Alavi, J. Mostaghimi</p> <p>16:00-16:30 OS5-15 <i>Invited</i> Electroactive Polymers as Actuators: Why Do They Deform? <u>G. Coativy</u>, K. Yuse, G. Diguet, L. Seveyrat, V. Perrin, F. Dalmas, S. Livi, J. Courbon, H. Takana, <u>J.Y. Cavallé</u></p>	<p>15:20-15:32 OS11-6 The Wall-to-Wall Collisions in the Microchannel Gas Flow <u>J.-W. Dong</u>, C.-Y. Huang</p> <p>15:32-15:44 OS11-7 Hydrodynamic Interaction of Deformable Micro Swimmers <u>K. Kubo</u>, T. Omori, T. Ishikawa</p> <p>15:44-15:56 OS11-8 Viscosity Estimation of a Two-dimensional Suspension Flow in a Narrow Channel by a Two-way Coupling Scheme <u>N. Okamura</u>, T. Fukui, M. Kawaguchi, K. Morinishi</p> <p>15:56-16:08 OS11-9 Enhanced Collective Migration of Endothelial Cells by Low Shear Stress in the Early Stage <u>R. Sugahara</u>, K. Funamoto</p>	<p>15:20-15:50 OS8-12 <i>Invited</i> NADPH Oxidase Regulates the Reactive Oxygen Species Response of Macrophage to Substrates Rigidity <u>Y.-C. Chuang</u>, H.-M. Chang, C.-Y. Li, Y. Cui, C.-L. Lee, <u>C.-S. Chen</u></p> <p>15:50-16:20 OS8-13 <i>Invited</i> A 3D-Printed Bioreactor Combining Direct Perfusion and PEMF Stimulation for Investigating the Biological Responses of Bone Tissue Models to Controlled Physical Stimuli <u>B. Masante</u>, S. Gabetti, A. Cochis, G. Putame, A. Sanginario, E. Fiume, F. Bairo, E. Verné, L. Rimondini, C. Bignardi, <u>D. Massai</u></p>	<p>15:20-16:00 OS9-3 <i>Invited</i> Hydrodynamical Evaluation of Microporous Covered Stent for the Treatment of Intracranial Aneurysms by Using Particle Imaging Velocimetry and in vitro Flow Simulator <u>T. Moriwaki</u>, T. Tajikawa, Y. Nakayama</p> <p>16:00-16:15 OS9-4 Parametric Study of Device Insertion Simulator for Endovascular Treatment for Investigating the Biological Responses of Bone Tissue Models to Controlled Physical Stimuli <u>H. Ota</u>, K. Takashima, Y. Haga, M. Ohta, C. Dai, M. Shojima</p> <p>16:15-16:30 OS9-5 Relationship between Contact Force and Catheter Movement in Aneurysm Model <u>T. Oishi</u>, K. Takashima, K. Yoshinaka, K. Yu, M. Ohta, K. Mori, N. Toma</p>	<p>Free Discussion 6 (CRF-43, 60, CRF-76 to 88, except CRF-86) (Remo)</p>	<p>Short Oral Presentation (YouTube)</p>		

16:50		<p>16:08-16:20 OS11-10 Evaluation of PAK1 Localization in Vascular Endothelial Cells by Hypoxic Stresses Using Microfluidic Devices <i>K. Sone, S. Hirose, D. Yoshino, K. Funamoto</i></p> <p>16:20-16:32 OS11-11 Numerical Simulation on the Effects of the Power-law Fluid on Lift Coefficient of a 2-Dimensional Cylinder <i>N. Masuyama, T. Fukui, M. Kawaguchi, K. Morinishi</i></p> <p>16:32-16:44 OS11-12 Computational Biomechanical Model of the Sponge's Choanocyte Chamber <i>T. Ogawa, T. Omori, T. Ishikawa</i></p>	<p>16:20-16:35 OS8-14 Endothelial Primary Cilia Remodeling in Response to Cyclic Substrate Stretching <i>T.-D. Do, T. Ohashi</i></p> <p>16:35-16:50 OS8-15 Atmospheric-pressure Plasma Discharge Current Classification with Deep Convolutional Neural Networks <i>J. Chang, S.-S. Huang, P.-H. Niu, C.-W. Chen, Y.-C. Cheng</i></p>	<p>16:30-16:45 OS9-6 The Effect of Three Kinds of Blood Flow-diameter Scaling Laws on Computed Tomography Fractional Flow Reserve (FFR_{CT}) <i>N. Li, B. Li, Y. Liu</i></p>				16:50	
BREAK / Exhibition									
17:10	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	17:10
	<p>IFS Tour</p>	<p>OS5: Advanced Applications of Multi-functional Fluids EHD, Advanced Multi-phase flow <i>Chair: Y. Iwamoto</i></p>	<p>OS11: Microfluidics and Microphysiological Modeling <i>Chair: T. Fukui</i></p>	<p>OS8: Advanced Physical Stimuli and Biological Responses <i>Chair: R. Shirakashi</i></p>	<p>OS9: Biomedical Flow Dynamics <i>Chairs: A. Qiao, T. Nakayama</i></p>	<p>OS21: IFS Collaborative Research Forum (AFI-2021)</p>	<p>OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics</p>		
17:10-18:10 IFS Tour	<p>17:10-17:30 OS5-16 Multifunctional Hybrid Filaments Comprising Aligned Nanocellulose and Carbon Nanotubes Synthesized by a Field-assisted Flow Focusing Method <i>H. Wise, H. Takana, A. Dichiaro</i></p> <p>17:30-17:50 OS5-17 Theoretical and Experimental Approaches to Ionic Diode Characteristics of Nanochannels <i>K. Doi, T. Kishimoto</i></p>	<p>17:10-17:50 OS11-13 <i>Invited</i> Blood Flow in Macro and Microfluidic Systems: From Fabrication to Applications <i>R. A. Lima, V. Carvalho, A. Souza, M. S. Souza, G. Nobrega, I. M. Gonçalves, R. R. Souza, S. F.C.F. Teixeira, J. E. Ribeiro</i></p> <p>17:50-18:02 OS11-14 Contact Line Dynamics of Pulsatile Microfluidic Interfaces Modulated by Wetting <i>J. G. Flores, A. Hernández-Machado, E. Corvera Poiré</i></p> <p>18:02-18:14 OS11-15 Dynamics of AC Electroosmotic Flow Subject to Pulsatile Pressure Gradient in Microchannels <i>S. I. Kaykanat, E. Corvera Poiré, K. Uguc</i></p> <p>18:14-18:26 OS11-16 Oxygen Gradient under Severe Hypoxia Changes <i>Dictyostelium</i> Migration Directionality <i>S. Hirose, J.-P. Rieu, C. Anjard, O. Cochet-Escartin, K. Funamoto</i></p> <p>18:26-18:38 OS11-17 Evaluation of Migration Speed of Cancer Cells by Different Types of Matrices Using Microfluidic Devices <i>S. Aratake, K. Funamoto</i></p>	<p>17:10-17:40 OS8-16 <i>Invited</i> Atmospheric-pressure Plasma Effects on Cancer Cells and Impedance Matching Circuit to Improve Plasma Power Conversion Efficiency <i>P. H. Niu, Y.-J. Cheng, Y.-C. Cheng</i></p> <p>17:40-17:50 Meeting for Award / Award Ceremony / Closing <i>S. Kawano, R. Shirakashi</i></p>	<p>17:10-17:40 OS9-7 <i>Invited</i> Development of an Original Software Applying Virtual Stent Deployment and CFD Simulation for the Selection of Patient-Specific Braided Stents <i>S. Fujimura, I. Kan, H. Takao, Y. Uchiyama, T. Ishibashi, K. Otani, K. Fukudome, Y. Murayama, M. Yamamoto</i></p> <p>17:40-18:10 OS9-8 <i>Invited</i> Simulation of Aneurysmal Haemodynamics after Flow-Diversion Treatment: Modelling the Flow-Diverting Stent as a Porous Medium <i>Y. Li, M. Zhang, M. Ohta</i></p> <p>18:10-18:25 OS9-9 Assessing the Relationship between WSS and TAV for Disturbed Flow on the Geometry of AVF for Hemodialysis <i>K. Takeda, H. Anzai, M. Zhang, W. Haoran, A. Kajiyama, M. Ohta</i></p> <p>18:25-18:40 OS9-10 Numerical Simulation in Lower Airway Using Eulerian Wall Film Model: Influence of Mucus Viscosity on Droplet Generation <i>Y. Shindo, S. Mugikura, N. Mori, T. Akaike, T. Matsunaga, M. Ohta, H. Anzai</i></p>			<p>Short Oral Presentation (YouTube)</p>	18:40	
BREAK									

19:00	ROOM 1	ROOM 2	ROOM 3	ROOM 4	ROOM 5	ROOM 6	ROOM 7	ROOM 8	19:00
			<p>OS11: Microfluidics and Microphysiological Modeling Chair: <i>K. Funamoto</i></p>						
			<p>19:00-19:12 OS11-18 On the Tangential Knudsen Force Induced by a Heated Substrate with Surface Microstructure <i>C. J. C. Oñic, T. Ohara, S. Yonemura</i></p> <p>19:12-19:24 OS11-19 Comparison of Permeability of 3D Microvascular Network Model under Controlled Oxygen Concentration <i>M. Nikaide, T. Osaki, K. Funamoto</i></p> <p>19:24-19:36 OS11-20 Reconstruction of 3D Human Brain Microvasculature on a Chip Using Brain Endothelial Cells, Astrocytes and Pericytes <i>M. Sato, M. Inagaki, Y. Sakamaki, K. Funamoto, M. Tachikawa</i></p>						
20:00									20:00

OS20: The 17th International Students / Young Birds Seminar on Multi-scale Flow Dynamics

- OS20-1: **Numerical Study on Mach Number Effects of Propeller on Propeller-Wing Interaction**
Y. Furusawa, K. Kitamura, H. Nagai
- OS20-2: **Aerodynamic Study of the Circular Arc Airfoil at Low Reynolds Numbers Using Cartesian Mesh CFD**
T. Takase, D. Sasaki, M. Okamoto
- OS20-3: **An Efficient Fuselage Concept Using Waverider Configurations for Supersonic Transport**
Y. Ishikawa, W. Yamazaki
- OS20-4: **A Comparative Study of Drag Coefficient for DrivAer Model with Realistic Shape using OpenFOAM**
H. Matsuura, S. Nara, S. Takahashi
- OS20-5: **Numerical Analysis of Droplet Impact onto a Wall Considering non-Newtonian or Dynamic Contact Angle Using Volume of Fluid Method**
K. Sakata, Y. Sato, Y. Matsukawa, Y. Matsushita, H. Aoki, Y. Akiyama, M. Shiota, T. Okabe, M. Daikoku, Y. Saito, J. Fukuno
- OS20-6: **Unsteady Flow Field around Flexible-membrane Wing at Low Reynolds Number**
K. Yamamoto, T. Ikami, K. Takahashi, K. Fujita, H. Nagai
- OS20-7: **Numerical Analysis of the Rotational Effect of the Non-Axisymmetric Cavitator in Supercavitating Flow**
J. Lim, S. Kim, J. Lee, H. Kim, J. Cho
- OS20-8: **Effects of Pulse Modulated Plasma Actuator on Pressure Distribution over an Airfoil at High Reynolds Numbers**
K. Asawa, N. Kubo, M. Tanaka, T. Fujino
- OS20-9: **CFD Analysis of Indoor Ventilation in a Dome Considering Advection/Diffusion of Droplet Nuclei**
G. Hirokawa, W. K. Arif, W. Yamazaki, H. Takahashi
- OS20-10: **Consideration of Suppression of Self-excited Oscillation by Different Re-entry Capsule Shapes**
M. Nomura, K. Fujita, H. Nagai
- OS20-11: **Large Eddy Simulation of Liquid Metal Flow in Co-axial MHD Energy Conversion Device**
R. Sasaki, T. Fujino, H. Takana, H. Kobayashi
- OS20-12: **Study of Aerodynamic Interference between Main Wing and Tail Wing Using 2D Building-Cube Method**
R. Kita, D. Sasaki

- OS20-13: **Experimental Investigation of Effect of Non-Newtonian Characteristics on Fluid Behavior of Jet in a Crossflow**
M. Miyamoto, M. Shirota, Y. Matsushita, H. Aoki, Y. Mawatari, M. Yamamura, Y. Saito
- OS20-14: **Understanding of Flow-Field of Pitching Airfoil at Low Reynolds Number**
Y. Yoshizane, T. Ikami, K. Fujita, H. Nagai
- OS20-15: **Numerical Simulation of Fluid Flow in a Counterflow-packed Bed**
M. Shirakawa, A. Hisatsune, K. Terui, Y. Saito
- OS20-16: **Axis Bundle Relationships between Vorticity Lines and Eigen-vortical-axis Lines in Vortical Core Region**
K. Hyoudou, K. Nakayama
- OS20-17: **An Investigation of Three-Dimensional Vortical Flow Structure in Isotropic Homogeneous Turbulence**
K. Kato, D. Aoyama, K. Nakayama
- OS20-18: **Aerodynamic Drag Optimization of Ahmed Model use Adjoint Method and EGO Algorithm**
C. Lai, Y. Li, S. Feng, Z. Huang, S. Wang
- OS20-19: **Coalescence of Vortical Regions and Bifurcation of Vortical Axes in a Homogeneous Isotropic Turbulence**
Y. Adachi, K. Nakayama
- OS20-20: **A Hierarchical Flow Scale Analysis in Development of a Vortex in a Homogeneous Isotropic Turbulence**
Y. Sendo, K. Nakayama
- OS20-21: **A Study on the Microscale Gas Flow in the Noncoalescence Phenomenon between Droplet and Liquid Pool**
C. J. C. Otic, X. Li, S. Yonemura
- OS20-22: **Development of an Aeroballistic Range with Reconfigurable Structures for Use in Studies on Projectile Aerodynamics**
K. Okamoto, D. Numata
- OS20-23: **Development of Low-speed Wind-tunnel for Basic Aerodynamic Research**
H. Harada, S. Ide, D. Numata
- OS20-24: **On the Use of a Multilayer Perceptron as an Aerodynamic Performance Approximator in Multi-Objective Transonic Airfoil Shape Optimization**
M. A. Hariansyah, K. Shimoyama
- OS20-25: **Characteristic of Droplet Size Distribution and the Variance of Atomization and Condensation Nozzles**
M. Kato, S. Moriya, J. Okajima, Y. Iga

- OS20-26: **Optimization of Electromechanical Dynamic Vibration Absorber for Flexible Space Structure**
T. Watanabe, A. Li, K. Goto, Y. Hara, K. Otsuka, K. Makihara
- OS20-27: **Study on Sizing Method on a Roadable Aircraft using OpenVSP**
H. Kaneku, D. Yamabata, S. Morizawa
- OS20-28: **Investigation of the Signals of Various Magnetization Non-destructive Testing Methods Affected by Plastic Strain When Testing Electrical Steel Sheet**
S. Zhang, S. Takeda, B. Ducharme, G. Sebald, T. Uchimoto
- OS20-29: **Evaluation of Bond Degradation between Rebar and Concrete using Electromagnetic Pulse-Induced Acoustic Testing Method**
X. Zhou, S. Takeda, T. Uchimoto, M. Hashimoto, T. Takagi, H. Alwashali, M. Maeda
- OS20-30: **Numerical Simulation of Unsteady Behavior of Arc Plasma Flow in a Cylindrical Nozzle**
K. Ino, T. Fujino, Y. Tanaka, M. Shigeta, Y. Inada, A. Kumada
- OS20-31: **Enhancing Piezoelectric Harvested Energy of an Advanced Switching Interface by Tunable Switching Intervals**
M. Zhou, Y. Hara, Y. Jia, Y. Shi, C. Soutis, H. Kurita, F. Narita, K. Otsuka, K. Makihara
- OS20-32: **Experimental Investigation of Flutter Power Generation with Piezoelectric Film**
K. Imagawa, K. Otsuka, Y. Jia, Y. Shi, C. Soutis, H. Kurita, F. Narita, K. Makihara
- OS20-33: **Multiphase Flow Simulation of Non-Newtonian Fluids including Many Solid Particles through Corrugated Tube**
S. Kawamata, Y. Kawamoto, S. Nara, T. Nohara, S. Takahashi, S. Obayashi
- OS20-34: **New MMC-Based Topology Optimization Method with Curvilinear Representation**
S. Hirotani, S. Dong, R. Kuzuno, T. Okada, K. Otsuka, K. Makihara
- OS20-35: **Frequency Spectrum Analysis of Microwave Signals Reflected from Partial Pipe Wall Thinning**
Y. Guo, G. Chen, N. Yusa, H. Hashizume
- OS20-36: **Iterative Modeling and Dynamic Analysis of Spherical Tensegrity**
E. Mori, T. Goto, N. Kawabata, K. Otsuka, K. Makihara
- OS20-37: **Optimization of Structural Layout for Composite Aircraft Wings**
Y. Inaba, S. Date, H. M. Alfandy, Y. Abe, K. Shimoyama, T. Okabe, S. Obayashi
- OS20-38: **Performance Investigation of Various Topologies of Small Darrieus Vertical Axis Wind Turbines**
H. Shiine, S. Imai, W. Yamazaki

- OS20-39: **Measurement and Modeling of Dynamic Contact Angle of Impacting Drops**
T. Okawa, Y. Fuchisawa, T. Okabe, M. Shiota
- OS20-40: **Investigation of the Acoustic Propagation to Detect the Defect in Multi-materials by Electromagnetic Pulse-induced Acoustic Testing (EPAT)**
N. Takeshita, T. Uchimoto, S. Takeda, T. Takagi, H. Kosukegawa, M. Hashimoto, G. Diguët
- OS20-41: **Consolidation of Bulk Material Made of Aluminum Powder by Severe Plastic Deformation Process**
R. Watanabe, H. Miki, S. Takeda, N. Nakayama
- OS20-42: **Effects of Wettability and Electrostatic Charge on Contact Line Instability of Impacting Drops**
K. Shirai, A. Kodama, T. Okabe, M. Shiota, Y. Matsukawa, Y. Saito, Y. Matsushita, H. Aoki, M. Daikoku, J. Fukuno
- OS20-43: **Quantitative Evaluation of Damage to Reusable Rocket Engine Combustion Chamber by Eddy Current Testing**
Y. Goto, S. Takeda, T. Uchimoto, S. Moriya, M. Takegoshi, E. Sato
- OS20-44: **Investigation of Hydrogen Embrittlement of Austenitic Stainless Steels by Electromagnetic Nondestructive Testing Method**
H. Miyauchi, T. Uchimoto, S. Takeda, N. Mary, H. Enoki, T. Iijima
- OS20-45: **Detection of Foreign Matter inside CFRP by Eddy Current Testing**
A. Seto, T. Uchimoto, S. Takeda, H. Kosukegawa, T. Takagi, M. Hashimoto
- OS20-46: **Predicting Tipping Points in Complex Systems using Machine Learning**
S. Hedkvist, L. Li, V. Gupta
- OS20-47: **Active Control of Thermal-Flow Field by Thermal Radiation in Participating Medium**
Y. Takagi, T. Kogawa, H. Gonome
- OS20-48: **Effect of Number of Turns in Closed-End Oscillating Heat Pipe**
K. Sone, K. Watanabe, K. Matsubara, K. Fujita, H. Nagai
- OS20-49: **Start-up Characteristics of Oscillating Heat Pipes with Hydrophobic Channel**
K. Watanabe, K. Sone, K. Fujita, H. Nagai
- OS20-50: **The Effect of Surface Roughness and Solvent Polymer Chain-Length on Solid-Liquid Interfacial Thermal Resistance**
Q. Y. Luo, Y. Li, S. Donatas, H. Matsubara, T. Ohara
- OS20-51: **Dependence of Thrust Efficiency on Propellant Mass Flow Rate of Radio-Frequency Inductively Coupled Plasma Thruster**
K. Akiyama, Y. Hirai, T. Fujino

- OS20-52: **Aerodynamic Characteristics and Flow Field of Free-flight Re-entry Capsules**
K. Yomo, N. Tanaka, K. Takahashi, T. Ogawa, K. Ohtani, K. Fujita, H. Nagai, K. Yamada
- OS20-53: **Penetration Evaluation of Inflatable Space Structure with Heat Curing at Hypervelocity Impact**
R. Kobayashi, M. Suzuki, N. Karasawa, D. Morimoto, K. Otsuka, K. Makihara
- OS20-54: **Low-speed Aerodynamic Testing of Next-generation Re-entry Capsule for Deep Space Exploration**
Y. Hamashima, T. Ikami, K. Takahashi, K. Fujita, H. Nagai, K. Yamada
- OS20-55: **Temperature Measurement inside Unsteady Cavitation in High Temperature Water**
Y. Okubo, Y. Iga, J. Okajima
- OS20-56: **Development of Automatic Thermal Switching Coating by Using Temperature Sensitive Gel**
M. Yano, J. Gong, H. Gonome
- OS20-57: **Effect of Liquid Viscosity on Liquid Jet in a Gas Crossflow**
K. Mukai, M. Shirota, Y. Matsushita, H. Aoki, Y. Mawatari, M. Yamamura, Y. Saito
- OS20-58: **Measurement of the Effect of Radiative Heat Transfer on Marangoni Convection**
D. Tominaga, Y. Kanda, A. Komiya
- OS20-59: **High Spatial-Resolution Measurement of Unsteady Natural Convection in a Tilted Rectangular Enclosure**
K. Nishiyama, T. Okabe, T. Miyagawa, M. Shirota
- OS20-60: **Effects of Atomizer Structure on Atomization and Combustion Characteristics of 3D-printed Metal Airblast Atomizers**
Y. Imai, A. Shibasaki, T. Kudo, M. Uchida, Y. Komatsu, A. Hayakawa, H. Kobayashi
- OS20-61: **Effect of Anisotropic Thermal Conductivity of CFRP on Heat Transport Performance of Oscillating Heat Pipe**
K. Matsubara, K. Fujita, H. Nagai
- OS20-62: **Thermal State Estimation via Artificial Neural Network for Spacecraft Systems**
H. Tanaka, K. Fujita, H. Nagai
- OS20-63: **Influence of Reynolds Number on Thermodynamic Self-suppression Effect of Cryogenic Cavitation**
S. Tsuchiyama, M. Nakano, J. Okajima, Y. Iga
- OS20-64: **Effect of Softened Coal Characteristics on Fluid Flow**
Y. Ikeda, Y. Saito

- OS20-65: **Experimental Investigation of Basic Characteristics of CNT Heater for Development of cnt-PSP**
T. Uchida, S. Suzuki, D. Numata
- OS20-66: **Design, Fabrication, and Performance Evaluation of a Solar-selective Absorber with Double-layer Dielectric Structure**
A. Takahashi, K. Matsumoto, H. Kaur, Y. Huang, R. Igarashi, A. Sakurai
- OS20-67: **Experiment Measurement of Time-Modulated Thermal Emission from Graphene Devices**
K. Matsumoto, Y. Kumakura, K. Misaki, T. Sugano, A. Sakurai
- OS20-68: **Enhancement of Non-equilibrium Light Emission Using a Distributed Bragg Reflector**
K. Sato, Y. Matsuno, N. Nagumo, K. Yamaga, R. Sugimoto, M. Araki, A. Sakurai
- OS20-69: **Active Thermal Radiation Control Using Graphene Ribbon Metasurfaces**
Y. Nanasawa, K. Yada, T. Shimojo, H. Okada, A. Sakurai
- OS20-70: **Active Thermal Emission Control using Phase-change Metasurface**
S. Nishino, N. Nagumo, H. Kishi, A. Sakurai
- OS20-71: **Study on Coating Method to Control the Thickness of TSP Layer**
T. Saichi, D. Numata

**OS21: The 21st International Symposium on Advanced Fluid Information
(AFI-2021)
IFS Collaborative Research Forum**

- CRF-1 **Radiation and Convection Coupling Calculation for Development of Thermal Barrier Fire Extinguishing Devices**
H. Gonome, Y. Takagi, T. Kogawa, J. Okajima
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