

## *Executive Committee Members*

Tetsuya Uchimoto (General Co-Chair of ICFD2024, Tohoku University)  
Gael Sebald (General Co-Chair of ICFD2024, INSA de Lyon, CNRS)  
Kaoru Maruta (Director of IFS, Tohoku University)

## *International Scientific Committee Members*

Chair: Shigeru Obayashi

### **Australia**

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Weihua Li  
Gary Rosengarten  
Victoria Timchenko

### **Canada**

Javad Mostaghimi

### **China**

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XinGang Liang  
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Philippe Dagaut  
Vincent Fridrici

Alexis Giauque

Gael Sebald

### **Germany**

Christian Boller

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Debasish Biswas  
Kentaro Doi  
Yuji Hattori  
Jun Ishimoto  
Takatoshi Ito  
Satoyuki Kawano  
Hideaki Kobayashi  
Kazunori Kuwana  
Kaoru Maruta  
Hiroki Nagai  
Taku Ohara

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Masaya Shigeta  
Toshiyuki Takagi  
Takashi Tokumasu

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Nam Il Kim

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### **Russia**

Sergey S. Minaev

### **Saudi Arabia**

Hong G. Im

### **Sweden**

Fredrik Lundell

### **Switzerland**

Bastien Chopard

### **Taiwan**

Chingyao Chen  
Chih-Yung Huang  
Yao-Hsien Liu  
Jongshinn Wu

### **USA**

Igor V. Adamovich  
Jeongmin Ahn  
Yiguang Ju  
Kozo Saito  
Rongjia Tao

## *Conference Venue*

ICFD2024 will take place in a hybrid fashion  
-both in-person and online.

### **Sendai International Center**

Aobayama, Aoba-ku, Sendai, 980-0856  
TEL (81)22-265-2211  
<http://www.aobayama.jp/english/>

## *Registration Fee*

Due Date	Registration Fee
Advanced Registration Fee (on or before Aug. 26, 2024)	General 16,000 JPY Student 3,000 JPY
On-site Registration Fee (from Aug. 27, 2024 to Nov. 14, 2024)	General 23,000 JPY Student 6,000 JPY

All participants are required to make a registration through the website.

## *Important Dates*

- June 15, 2024:** Deadline for **Presentation Submission**. Please present your paper title / author's name / keywords through Presentation
- July 19, 2024:** Submission page of ICFD2024 website. Deadline for **Short Paper (2 to 4 pages) Submission**
- Aug. 26, 2024:** Deadline for Advanced Registration

## *Publication & Special Issues of International Journals*

It will be available to download the proceedings through the ICFD2024 website. The URL and password will be informed the participants by e-mail in the morning on November 18, 2024. Special Issue of the Conference is being planned to be published in a journal.

For more details, please visit ICFD2024 website.

## *ICFD Secretariat*

For further details and related questions, please contact **ICFD2024 Secretariat**: [icfd2024@grp.tohoku.ac.jp](mailto:icfd2024@grp.tohoku.ac.jp)  
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TEL&FAX: (81)22-217-5301  
<http://www.ifs.tohoku.ac.jp/icfd/2024/>

# The 21st International Conference on Flow Dynamics

Second Circular

As of April 9, 2024

<https://www.ifs.tohoku.ac.jp/icfd/2024/index.html>

Organized by  
Executive Committee of ICFD

Supported by  
Institute of Fluid Science,  
Tohoku University

## November 18 - 20, 2024



## SCOPE

The 21st International Conference on Flow Dynamics (ICFD2024), in the annual series since 2004, will be held from November 18th to 20th, 2024 at Sendai, Japan. The objective of this conference is to explore new horizons in science and technology in Flow Dynamics by discussing and exchanging information related to the most advanced scientific fields and to cutting edge technologies. ICFD is now recognized by the 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, ICFD2024 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 for future generations of scientists and engineers.

Flow Dynamics is an Integrated Flow Science which 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 in 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 difficult tasks that human society is facing, 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 ICFD2024 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 believe that you will enjoy beautiful and pleasant atmosphere of the autumn at Sendai, since the beginning November is the best season of Sendai.

Tetsuya Uchimoto, Professor  
 Tohoku University  
 and  
 Gael Sebald, Professor  
 INSA de Lyon, CNRS  
 General Co-Chairs, ICFD2024

## Plenary Lectures

- Prof. Annemie Bogaerts** (University of Antwerp, Belgium)  
 "Computational fluid dynamics simulations of plasma reactor design, for gas conversion applications"
- Prof. Epaminondas Mastorakos** (University of Cambridge, UK)  
 "Modelling of dual-fuel combustion"
- Prof. Jonathan F. Morrison** (Imperial College, London, UK)  
 "Boundary layer control with moving surfaces"

## Sessions

### General Session:

**GS1: General Session**  
 Co-Organizers: T. Uchimoto, K. Funamoto

### Symposium / Workshop / Organized Sessions:

- OS1: The Second International Symposium on Integrated Flow Science I & II**  
 Advanced Materials and its Energy Application  
 Organizer: S. Samukawa  
 Multiphase Energy Science and Technology (Combination of Monozukuri-Fluid Science / Engineering)  
 Organizer: J. Ishimoto
- OS2: The Second International Symposium on Integrated Flow Science II**  
 Combustion Technology and Fundamentals  
 Co-Organizers: P. Dagaut, H. Im, O.L. Gulder, K. Maruta
- OS3: The First International Symposium on Integrated Flow Science IV**  
 Advanced Semiconductor and Digital Transformation  
 Co-Organizers: D. Ohori, K. Endo

- OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 16th Edition**  
 Co-Organizers: Y. Saito, L. Kamps
- OS5: Advanced Applications of Multi-functional Fluids**  
 Co-Organizers: H. Takana, T. Fujino, K. Doi, N. Takeuchi
- OS6: Free Flight Experiment with MSBS and Ballistic Range**  
 Co-Organizers: S. Obayashi, K. Seo, H. Nagai
- OS7: Advances in Simulation Techniques for the Computational Aerosciences**  
 Co-Organizers: Y. Abe, F. Witherden, B. Vermeire, T. Haga, K. Otsuka, N. Tsushima, J. S. Park
- OS8: Advanced Physical Stimuli and Biological Responses**  
 Co-Organizers: T. Sato, T. Ohashi, S. Kawano, R. Shirakashi, Y.-C. Cheng
- OS9: Biomedical Flow Dynamics**  
 Co-Organizers: H. Anzai, M. Zhang, K. Takashima, T. Nakayama, A. Qiao, M. Ohta
- OS10: Two-Phase Thermal Control for Spacecraft**  
 Co-Organizers: K. Odagiri, M. Nishikawara, H. Nagai
- OS11: Microfluidics and Microphysiological Modeling**  
 Co-Organizers: K. Funamoto, T. Fukui, T. Omori, E. Corvera Poiré
- OS12: Complex Thermofluid System**  
 Co-Organizers: C.-Y. Chen, Y.-H. Liu, Y.-H. Liao
- OS13: Flow Realization, Measurement and Visualization**  
 Co-Organizers: T. Yamagata, S. Funatani, S. Iio, K. Funamoto
- OS14: Innovations in Oncology**  
 Co-Organizers: C. Moyret-Lalle, R. Charlotte, J.-P. Rieu, F. Hollande, K. Funamoto
- OS15: Turbulence: from Fundamentals to Applications**  
 Co-Organizers: Y. Hattori, T. Ishihara, Y. Tsuji
- OS16: Vortex Motion**  
 Co-Organizers: Y. Hattori, S. Llewellyn Smith
- OS17: Supercritical Fluid**  
 Co-Organizers: Y. Kanda, H. Yingxue, K. Ragui, A. Komiya
- OS18: Flow measurements using PSP/TSP technique**  
 Co-Organizers: C.-Y. Huang, Y. Egami, Y. Matsuda, H. Nagai
- OS19: Multiphase Thermal Fluid Flow and Its Interface Dynamics**  
 Co-Organizers: J. Okajima, T. Okabe, M. Shirota
- OS20: Multiphysics in Fluid Mechanics**  
 Co-Organizers: M. Shigetani, M. Tanaka, Y. Saito, Y. Inada, J. Yoshikawa, N. Kodama, H. Komen, M. Sugimoto
- OS21: Smart Fluids & Soft Matters and Their Advanced Applications**  
 Co-Organizers: M. Nakano, X. Gong, W. Li, G. Sebald
- OS22: Liaison Office Session**  
 Co-Organizers: M. Ohta, T. Uchimoto, T. Tokumasu, A. Komiya
- OS23: The 20th International Students / Young Birds Seminar on Multi-scale Flow Dynamics**  
 Co-Organizers: T. Koizumi, A. Nakamura, M. Okawa, D. Tsuneoka  
 Supervisors: Y. Kanda, T. Ikami, Y. Kaneko
- OS24: The 24th International Symposium on Advanced Fluid Information (AFI-2024)**  
 ➤ **IFS Collaborative Research Forum**  
 Co-Organizers: H. Masuda, T. Uchimoto
- OS25: IFS Lyon Center Collaborative Research Forum**  
 Organizer: T. Uchimoto
- OS26: 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: TBD