

## Executive Committee Members

Hiroki Nagai (General Co-Chair of ICFD2022,  
Tohoku University)  
Chih-Yung Huang (General Co-Chair of ICFD2022,  
National Tsing Hua University)  
Kaoru Maruta (Director of IFS, Tohoku University)

## International Scientific Committee Members

Chair: Shigeru Obayashi

### Australia

Masud Behnia  
Weihua Li  
Gary Rosengarten  
Victoria Timchenko

### Canada

Javad Mostaghimi

### China

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XinGang Liang  
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Jean-Yves Cavallé  
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  
Hideya Nishiyama

Taku Ohara  
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Takehiko Sato  
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### 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

### Sendai International Center

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

\*\* Depending on circumstances, we may consider another venue or online or Hybrid. \*\*

## Registration Fee

	Without Banquet
Advanced Registration Fee (on or before Aug. 25)	General 15,000 JPY Student 3,000 JPY
Onsite Registration Fee (on and after Aug. 26)	General 25,000 JPY Student 5,000 JPY

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

## Important Dates

- June 15, 2022:** Deadline for **Presentation Submission**. Please present your paper title / author's name / keywords through Presentation Submission page of ICFD2022 website.
- July 22, 2022:** Deadline for **Short Paper (2 or more pages) Submission**
- Aug. 25, 2022:** Deadline for Advanced Registration

## Publication & Special Issues of International Journals

It will be available to download the proceedings through the ICFD2022 website. The URL and password will be informed the participants by e-mail in the morning on November 9, 2022. Special Issue of the Conference is being planned to be published in a journal.  
For more details, please visit ICFD2022 website.

## ICFD Secretariat

For further details and related questions, please contact  
**ICFD2022 Secretariat:** [icfd2022@grp.tohoku.ac.jp](mailto:icfd2022@grp.tohoku.ac.jp)  
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2-1-1, Katahira, Aoba-ku, Sendai, 980-8577, JAPAN  
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<http://www.ifs.tohoku.ac.jp/icfd/2022/>

# The 19<sup>th</sup> International Conference on Flow Dynamics

Second Circular

As of March 29, 2022

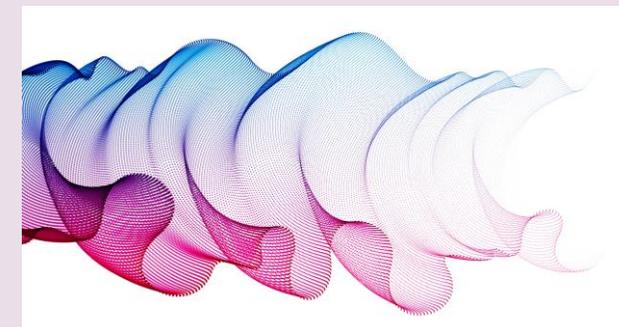
<http://www.ifs.tohoku.ac.jp/icfd/2022/index.html>

Organized by  
Executive Committee of ICFD

Supported by  
Institute of Fluid Science,  
Tohoku University



## November 9 - 11, 2022



## SCOPE

The 19th International Conference on Flow Dynamics (ICFD2022), in the annual series since 2004, will be held from November 9th to 11th, 2022 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, ICFD2022 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 ICFD2022 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 and we are not sure if we can get together at Sendai in November 2022 or not. If so, 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. If not, we will do our best to make ICFD2022 successful as the online conference.

Hiroki Nagai, Professor,  
 Tohoku University &  
 Chih-Yung Huang, Professor,  
 National Tsing Hua University  
 General Co-Chairs, ICFD2022

## Plenary Lectures

Professor Hideaki Kobayashi (Tohoku University, Japan)  
 Professor Konstantinos Kontis (University of Glasgow, UK)  
 Professor Khalid M. Saqr (Alexandria University, Egypt / Bio-CFD Inc, USA)

## Sessions

### General Session:

#### GS1: General Session

Co-Organizers: H. Nagai, A. Hayakawa

### Symposium / Workshop / Organized Sessions:

- OS1** The Tenth International Symposium on Innovative Energy Research I & II  
 &  
**OS3** OS1: Advanced Materials and its Energy Application  
 Organizer: S. Samukawa  
 OS3: Multiphase Energy Science and Technology (Combination of Monozukuri-Fluid Science / Engineering)  
 Organizer: J. Ishimoto
- OS2: The Tenth International Symposium on Innovative Energy Research II**  
 Combustion Technology and Fundamentals  
 Co-Organizers: P. Dagaut, H. Im, N. I. Kim, K. Maruta
- OS4: Flow Dynamics and Combustion Technology of Hybrid Rocket Propulsion, 14th Edition**  
 Co-Organizers: T. Shimada, K. Sawada

- OS5: Advanced Applications of Multi-functional Fluids**  
 Co-Organizers: H. Takana, T. Fujino, K. Doi, N. Takeuchi, Y. Iwamoto
- OS6: Free Flight Experiment with MSBS and Ballistic Range**  
 Co-Organizers: S. Obayashi, K. Seo, H. Nagai
- OS7: Smart Fluids & Soft Matters and Their Advanced Applications**  
 Co-Organizers: M. Nakano, X. Gong, W. Li, G. Sebald
- 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: Biomolecular Dynamics**  
 Co-Organizers: Y. Mukai, K. Etchuya, M. Ohta
- 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: Porous Media**  
 Co-Organizers: A. Suzuki, S. Tupin, M. Ohta
- 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, Y. Feng, Y. Hu, A. Komiya
- OS18: Flow Dynamics of Diffusion-reactive and Phase Transition Systems**  
 Co-Organizers: J. Okajima, R. Fursenko, V. Guvernov, S. Minaev
- OS19: Fluid Flow Experiment in Geoscience**  
 Co-Organizers: Y. Mukuhira, T. Ishibashi
- OS20: Liaison Office Session**  
 Co-Organizers: M. Ohta, T. Uchimoto, T. Tokumasu, A. Komiya
- OS21: The 18th International Students / Young Birds Seminar on Multi-scale Flow Dynamics**  
 Co-Organizers: A. Tsunoda, K. Nomoto, M. Ono  
 Supervisors: A. Suzuki, S. Takeda, Y. Kanda, J. Okajima
- OS22: The 22nd International Symposium on Advanced Fluid Information (AFI-2022)**  
 > **IFS Collaborative Research Forum**  
 Co-Organizers: H. Masuda, H. Nagai
- OS23: AFI-2022 IFS Lyon Center Collaborative Research Forum**  
 Organizer: T. Uchimoto
- OS24: 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