

Report on 12th Optics & Photonics International Congress (OPIC 2023) –Reviving Face-to-Face Conference Overcoming the Difficulties of COVID-19–

Shuji SAKABE,¹ Fumihiko KANNARI,² and Yoshiaki KATO³

¹Chair of OPIC 2023 Organizing Committee; Professor Emeritus, Kyoto University, Kyoto, 611-0011

²Chair of OPIC 2023 Steering Committee; Professor Emeritus, Keio University, Yokohama, 223-8522

³Congress Co-Chair of OPIC 2023, Professor Emeritus, Osaka University, Osaka, 565-0871

(Received May 31, 2023)

1. Introduction

Optics and Photonics International Congress (OPIC) has been organized by the Optics and Photonics International Council (OPI Council) and held annually at Pacifico Yokohama since 2012, in co-location with the Optics and Photonics International Exhibition (OPIE). The 12th OPIC was hosted April 17-21, 2023 by the Co-Chairs: Reinhart Poprawe (Professor Emeritus, RWTH Aachen, Germany), Christopher P. J. Barty (Professor, University of California Irvine, USA), Ruxin Li (Professor, Shanghai Institute of Optics and Fine Mechanics, China), and Yoshiaki Kato (Professor Emeritus, Osaka University, Japan).

OPIC is composed of Specialized International Conferences, covering a range of technology fields: lasers, biomedicine, nano-photonics, optical measurement, optical manipulation, x-ray optics, IoT, display and lighting, high energy density science, power transmission, and space and earth science. By holding different optics-related technical conferences in one location based on common elemental technologies and by sharing the supply and demand in various fields, OPIC contributes to accelerating the development and applications of these technologies and has evolved into one of the largest international conferences, suitable for participants to efficiently interact each other on the latest advances in science and technology of optics, photonics, and their applications.

Due to the world-wide spread of the new coronavirus (COVID-19), OPIC2020 and 2021 were held in online/virtual format and OPIC2022 in hybrid format. Despite the organizational challenges, 11 (2020, 2021) and 15 (2022) Specialized International Conferences were held, with 421 (2020), 879 (2021), and 970 (2022) participants and 490 (2020), 484 (2021), and 625 (2022) contributed papers, respectively. This strong participation during the pandemic has illustrated the importance of this congress and renewed our awareness that this annual meeting should not be interrupted. Though the coronavirus has not subsided completely even after three years, we decided to hold OPIC2023 as a full face-to-face meeting, like OPIC2019 before the pandemic, while prioritizing the safety and health of the participants at the congress.

The organizer, OPI Council, is very grateful that the full face-to-face OPIC meeting, which had been suspended since 2019, has been revived this year in Yokohama. In total, 723 papers

were presented to a collective audience of 1063 registered participants from 49 countries, and OPIC 2023 recovered close to the level of the in-person conference of OPIC 2019. The evolution in the numbers of specialized conferences, papers presented, and participants of OPIC during 2012-2023 is shown in Fig. 1.

This year, the OPIC 2023 Plenary Session was held in two days: Session I (academic) at 16:20 - 18:00 on April 18, and Session II (industry) at 16:20 - 18:50 on April 19 (Fig. 2). Five outstanding plenary lectures were presented (Fig. 3).

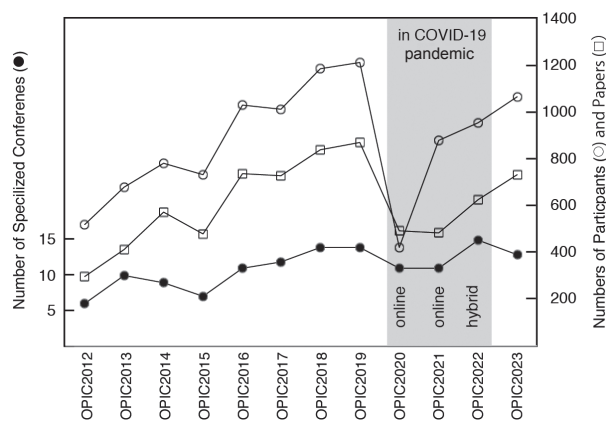


Fig. 1 Transition of OPIC during 2012-2023.

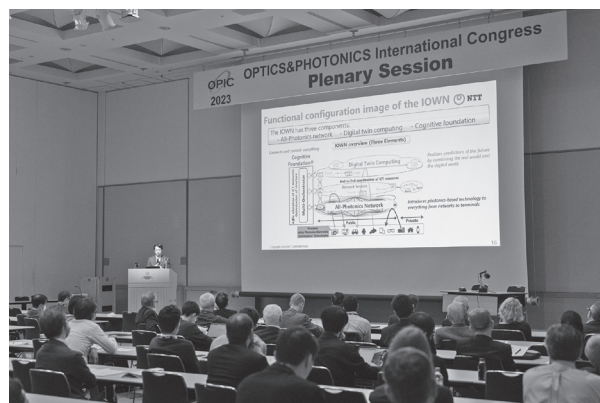


Fig. 2 Plenary session of OPIC2023.



Fig. 3 Plenary speakers of OPIC2023.

(From left) Prof. H. Katori, Dr. R. Hvězda, Mr. H. Mukawa, Dr. A. Okada, and Dr. J. Eichenholz.

Session I

- I-1) Prof. Hidetoshi Katori (The University of Tokyo, Japan), “Making optical lattice clocks compact and useful for real-world applications”.
- I-2) Dr. Roman Hvězda (ELI Beamlines Facility, Extreme Light Infrastructure), “The Extreme Light Infrastructure: Prospect of Multidisciplinary Science and Research of Ultra-Intensive and Ultra-Short Laser Pulses”.

Session II

- II-1) Mr. Hiroshi Mukawa (Sony Group Corporation), “The Metaverse and XR Technologies”.
- II-2) Dr. Akira Okada (NTT Science and Core Technology Laboratory Group), “IOWN (Innovative Optical and Wireless Network): Concept and related photonics technology”.
- II-3) Dr. Jason M. Eichenholz (Luminar Technologies Inc.), “How chip level up innovation unlocks LiDAR performance to drive the next generation of vehicle autonomy and safety systems”.

The plenary session was opened with greetings by Congress Co-Chairs. Before each presentation, the Plenary Speakers, H. Katori, R. Hvězda, H. Mukawa, A. Okada, and J. Eichenholz, were introduced by Profs. Y. Kato, C. Barty, F. Kannari, H. Murata, and R. Poprawe, respectively.

The OPIC Banquet was held in the evening of April 19, right after the Plenary Session II, at the Ballroom of the Intercontinental Hotel adjacent to the Conference Hall. The Banquet was started with a traditional “Kagami-Biraki” (sake-cask breaking) by the Congress and Committee Chairs and the Plenary Speakers (Fig. 4), followed by a toast by the IAB Chair and the Conference Chairs. At the fully packed banquet hall, the participants have enjoyed free conversations after three-year restrictions.

It was announced at the end of the Banquet that OPIC 2024 will be held 22-26 April, 2024 at Pacifico Yokohama under Professor Toyohiko YATAGAI as the Congress Chair.

In the following, we briefly report on operation, implementation, and summary of OPIC 2023.



Fig. 4 Kagami-Biraki at the OPIC 2023 Banquet.

2. Operation of OPIC 2023

At OPIC2023, in principle, all the Specialized International Conferences were held face-to-face according to the decision of the OPIC Steering Committee. There were several technical conferences that continued to use the hybrid format on their own, since the hybrid scheme with remote connection is convenient for speakers from overseas. Almost all participants got together at the conference site because domestic participants were highly recommended to join at Pacifico Yokohama.

Unfortunately, the participation rate of the poster presenters (especially students) to the oral presentation venues was not very high. This would be detrimental to students who became accustomed to remote conferences. They have tended to participate in international conferences with only their own presentations as the task. When we go back to the face-to-face conference scheme, it will be necessary for students to re-learn the purpose and process of international conference presentation and participation.

Looking back on the face-to-face implementation, the question-and-answer session went smoothly, leading to individual discussions after lectures. Meanwhile, the poster session was held in one section of the Optics and Photonics International Exhibition (OPIE2023). This year, the number of companies participating in OPIE has increased significantly, and as a result, the size of the poster venue was limited. It will be necessary to reconsider the location of the poster presentations next year.

To maximize attendee convenience, the presentation time schedules of the Specialized International Conferences were synchronized, and the conference program and access to the abstracts were properly managed by the OPIC staff. Abstracts of all papers presented at OPIC2022 were available to all registered attendees for download and access at the conference website.

To promote exchange between OPIC and OPIE, the OPIC enlightenment seminar titled “Latest Technology Trends” was held remotely on March 22-24 by the representatives of Specialized International Conferences. Pre-registration was required, but participation was free of charge. Thanks to the enthusiastic and easy-to-understand presentations of the lecturers, the seminar was very successful in introducing the world’s latest trends in optics and photonics to seminar participants from various industries.

3. Implementation of Specialized International Conferences

At OPIC 2023, 13 Specialized International Conferences were held by the Conference Chairs as shown in Table 1. The congress program, including messages by the Conference Chairs, abstracts of the Plenary Lectures, and brief summaries of the invited and contributed papers of the Specialized International Conferences were available on the OPIC website. The 1-2-page abstracts of all papers were available to all participants on the web during the Congress.

Table 2 shows the numbers of the presented papers and the registered participants of the 13 Specialized International Conferences. Detailed accounts of each conference will be reported separately in this and future issues of *The Review of Laser Engineering*.

4. Summary of OPIC 2023

The Optics & Photonics International Congress 2023 (OPIC

Table 1 Specialized International Conferences in OPIC2023 and Conference Chairs.

The 12th Advanced Lasers and Photon Sources (ALPS2023)	Hitoki Yoneda and Ruxin Li (China)
The 9th Biomedical Imaging and Sensing Conference (BISC2023)	Toyohiko Yatagai
Cyber Physical Systems enabled by Sensing/Network/AI and Photonics Conference 2023 (CPS-SNAP2023)	Ronald Freund
International Conference on High Energy Density Science 2023 (HEDS2023)	Ryosuke Kodama and Yasuhiko Sentoku
International Conference on Nano-photonics and Nano-optoelectronics 2023 (ICNN2023)	Yasuhiko Arakawa
Laser Display and Lighting Conference 2023(LDC2023)	Kazuo Kuroda, Hiroshi Murata, and Fergal Shevlin (Ireland)
Conference on Laser and Synchrotron Radiation Combination Experiment 2023 (LSC2023)	Toshihiko Shimizu
Laser Solutions for Space and the Earth 2023 (LSSE2023)	Satoshi Wada
The 10th Optical Manipulation and Structured Materials Conference (OMC2023)	Takashige Omatsu, Kishan Dholakia (UK), and Sile Nic Chormaic
Optical Technology and Measurement for Industrial Application 2023 (OPTM2023)	Takeshi Hatsuzawa, Rainer Tutsch (Germany), Toru Yoshizawa, and Yukitoshi Otani
Optical Wireless and Fiber Power Transmission Conference 2023 (OWPT2023)	Tomoyuki Miyamoto and Motoharu Matsuura
Tiny Integrated Laser and Laser Ignition Conference 2023 (TILA-LIC2023)	Takunori Taira
International Conference on X-ray Optics and Applications 2023 (XOPT2023)	Tetsuya Ishikawa and Kazuto Yamauchi

Table 2 Summary of the numbers of presentations and registrants.

	Number of Presentations				Number of Registrants			
	Oral		Poster	Total	General	Student	Invited	Total
	Invited	Contributed						
Plenary, Congress	5			5			77	77
ALPS	30	83	70	183	94	100	30	224
BISC	10	28	25	63	37	29	10	76
CPS-SNAP	8	7	1	16	17	2	9	28
HEDS	42	2	17	61	38	9	22	69
ICNN	13	19	14	46	40	22	3	65
LDC	21	31	5	57	74	25	3	102
LSC	32	6		38	32	9		41
LSSE	10	13		23	26	2	2	30
OMC	9	47	4	60	35	36	14	85
OPTM	5	16	8	29	27	10	4	41
OWPT	12	25	9	46	60	30	1	91
TILA-LIC	16	16	5	37	33	6	1	40
XOPT	9	25	19	53	68	12	14	94
Joint (ALPS+HEDS+XOPT)	3			3				
Joint (BISC+OMC+OPTM)	3			3				
Total	228	318	177	723	581	292	190	1063

2023) and Optics and Photonics International Exhibition (OPIE2023) were held April 17-21, 2023. In total, 723 papers were presented at the Plenary Session and thirteen Specialized International Conferences of OPIC 2023. The registered participants were 1063, distributed over 49 countries; Japan, China, Taiwan, Korea, USA, Germany, France, Italy, UK, India, Russia, Philippines, Czech Republic, Spain, Viet Nam, Canada, Romania, Brazil, Hong Kong, Australia, Lithuania, Poland, Austria, Bangladesh, Egypt, Iran, Ireland, Israel, Malaysia, Mexico, Netherlands, Portugal, Saudi Arabia, Switzerland, Turkey, Belarus, Belgium, Bhutan, Finland,

Hungary, Indonesia, Kazakhstan, Myanmar, Nigeria, Norway, Pakistan, Singapore, Sweden, Ukraine (in order of the numbers of the participants), with 40% of the participants from abroad.

The OPIC Specialized International Conferences were held with many specialists and students for paper presentation and participation. The organizers are confident that the organization and operation of OPIC2023 were successful, contributing to recognition of OPIC as a high-quality international conference on optics and photonics. On the other hand, we are still coming back from COVID-19: This year, the number of papers was still about 84% and the number of participants was about

88% compared with OPIC 2019.

The organizers believe that OPIC can be the real face-to-face communication venue for science and technology of optics and photonics. The inspirations for new and/or collaborative research often arise from informal conversations at coffee breaks, conference banquet and lobbying. The recruitment activities of young researchers are also extremely important at in-person meetings.

5. Acknowledgement

We would like to thank all participants to OPIC 2023. We are very grateful to Prof. H. Katori, Dr. R. Hvězda, Mr. H. Mukawa, Dr. A. Okada, and Dr. J. Eichenholz for presenting the plenary lectures. We are also indebted to Congress Co-Chairs, Prof. R. Poprawe, Prof. C. P. J. Barty and Prof. R. Li, for providing advice and encouragement in organizing OPIC 2023.

We deeply appreciate Chairs, secretaries, and staffs of the Specialized International Conferences for organizing valuable and active conferences, as well as the board and committee members of the Organizing Committee and the Steering Committee for their contribution to organize OPIC 2023. Also, thanks are due to the staffs of OPIC management for their dedication to implementing OPIC.

We would like to thank

Ministry of Education, Culture, Sports, Science and Technology (MEXT)
Ministry of Economy, Trade and Industry (METI)
Ministry of Health, Labor and Welfare (MHLW)
Ministry of Agriculture, Forestry and Fisheries (MAFF)
Ministry of Land, Infrastructure, Transport and Tourism (MLIT)
Japan Science and Technology Agency (JST)
New Energy and Industrial Technology Development Organization (NEDO)
KEIDANREN (Japan Business Federation)
Japan Tourism Agency (JTA)

for supporting OPIC 2023.

Also, we appreciate

The National Institute of Advanced Industrial Science and

Technology (AIST)

The National Institutes for Quantum and Radiological Science and Technology (QST)

RIKEN

The Atomic Energy Society of Japan (AESJ)

The Japan Society of Plasma Science and Nuclear Fusion Research (JSPF)

The Optical Society of Japan (OSJ)

Optoelectronic Industry and Technology Development Association (OITDA)

Institute for Laser Technology (ILT)

Japan Photonics Council (JPC)

OPTICA (Formerly OSA, USA)

Fraunhofer Institute for Laser Technology (ILT, Germany)

PIDA-Photonics Industry & Technology Development Association (Taiwan)

Photonics Media (USA)

for cooperation to organize OPIC 2023.

We would like to thank the following organizations for their financial support:

The Amada Foundation

National Institute of Information and Communication Technology

Nippon Sheet Glass Foundation for Materials Science and Engineering

Tsurugi-Photonics Foundation

Support Center for Advanced Telecommunications Technology Research, Foundation.

Furthermore, we would like to thank the corporate sponsors for their generous supports:

OPTO SCIENCE, INC.

SPIE

Hamamatsu Photonics K. K.

Japan Laser Corp.

Okamoto Optics

KATAOKA Corp.

THORLABS Japan.

Partnerships with SPIE as International Partner and PHOTONICS MEDIA and OPTRONICS as Media Partners are also greatly appreciated.