Laser Flash

Report on 14th Optics & Photonics International Congress (OPIC 2025)

Toyohiko YATAGAI,[1] Fumihiko KANNARI,[2] and Osamu MATOBA[3]

[1]*Congress Co-Chair of OPIC 2025, Professor Emeritus, Utsunomiya University, Utsunomiya, Tochigi 321-8505*

[2]*Chair of OPIC 2025 Organizing Committee; Professor Emeritus, Keio University, Yokohama, Kanagawa 223-8522*

[3]*Chair of OPIC 2025 Steering Committee; Professor, Kobe University Kobe, Hyogo 657-8501*

(Received June 23, 2025)

1. Introduction

The Optics and Photonics International Congress (OPIC), a prestigious annual event, has been meticulously organized by the Optics and Photonics International Council (OPI Council) and held annually at the prestigious venue of Pacifico Yokohama since 2012. The 14th OPIC was graciously hosted during April 21-25, 2025 by the Co-Chairs: Kishan Dholakia (Professor, University of St. Andrews, United Kingdom), Shuji Sakabe (Professor Emeritus, Kyoto University, Japan), Irina Sorokina (Professor, Norwegian University of Science and Technology, Norway), Din Ping Tsai (Professor, City University of Hong Kong, Hong Kong), and Toyohiko Yatagai (Professor Emeritus, University of Tsukuba and Utsunomiya University, Japan).

OPIC is composed of a series of Specialized International Conferences, covering a range of technology fields: lasers, biomedicine, nano-photonics, THz-wave, optical measurement, optical manipulation, x-ray optics, IoT, display and lighting, high energy density science, power transmission, space and earth science, agriculture and foods. 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, providing an optimal platform for participants to efficiently interact with each other on the latest advances in science and technology of optics, photonics, and their applications.

This year marks the 100th anniversary of the first achievements in quantum mechanics by Werner Heisenberg, Max Born, and Jordan Pascual. In recognition of this important milestone and taking into account the growth and significance of quantum science, UNESCO has declared the year 2025 as the International Year of Quantum Science and Technology. OPIC 2025 has been officially registered with UNESCO as one of the international conferences on quantum science to be held in 2025.

Having overcome the difficult conditions faced in OPIC2020 and 2021 due to the impact of COVID-19, OPIC has returned to a fully in-person format from 2023. The evolution in the numbers of specialized conferences, papers presented, and participants of OPIC during 2012-2025 are shown in Fig. 1. At OPIC2025, several Specialized International Conferences were not held annually or were held overseas, resulting in a slight decrease in the number of participating Specialized International Conferences compared to OPIC2024, but two new conferences were added.

In this year, the OPIC 2025 Plenary Session was held, featuring the following distinguished speakers:

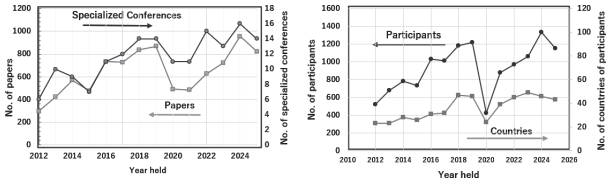

Fig. 1 Transition of OPIC on number of Specialized International Conferences, number of papers, number of participants, and number of countries of participants since the first OPIC held in 2012.

1) Dr. Shiro Yamakawa (Japan Aerospace Exploration Agency (JAXA), Japan), "Lasers in space: laser utilization in space programs and recent topics on the optical data relay satellite in JAXA".
2) Prof. Kenji Ohmori (Institute for Molecular Science (IMS), Japan), "Ultrafast quantum computing with ultracold atom arrays at quantum speed limit".
3) Prof. R. J. Dwayne Miller (University of Toronto, Canada), "What is life? Towards imaging the molecular machinery of the cell".

As a new initiative, tutorial sessions were held on the afternoons of the 21st and 22nd. In the tutorial lectures, eight up-and-coming lecturers took up the latest trends in hot research fields and explained important academic fundamentals and technologies. The lectures began with a basic explanation that was easy to understand even for students and those unfamiliar with the field. No prior registration or additional participation fee was required. The lecturers and titles of the eight tutorial lectures are as follows. The carefully prepared, high-quality lectures were well received.

1) Dr. Jun Sakuma (Lasertec Corporation, Japan), "Solid-state DUV laser sources for semiconductor inspection tools".
2) Dr. Hideki Hirayama (Quantum Optodevice Laboratory, RIKEN, Japan), "Recent progress of AlGaN-based deep-

Fig. 2 Plenary speakers of OPIC2025. (From left) Dr. Shiro Yamakawa, Prof. Kenji Ohmori, and Prof. R. J. Dwayne Miller.

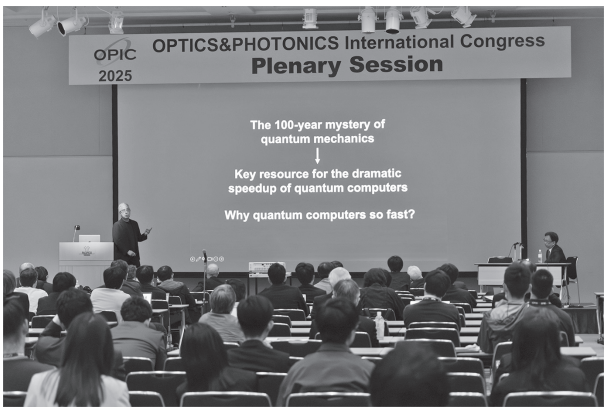

Fig. 3 Snapshot of plenary session of OPIC2025.

UV LEDs and LDs and their applications".

3) Dr. Masanao Kamata (Sony Semiconductor Solutions Corporation, Japan), "R&D progress of Sony's surface emitting laser technology".
4) Dr. Kazuue Fujita (Central Research Laboratory, Hamamatsu Photonics K.K., Japan), "Engineering research on quantum cascade lasers and its development to room temperature terahertz semiconductor source".
5) Dr. Koji Sugioka (RIKEN Center for Advanced Photonics, Japan), "High performance laser processing with short wavelength and short pulse lasers".
6) Prof. Satoshi Hasegawa (Center for Optical Research and Education (CORE), Utsunomiya University), "Laser processing with machine learning".
7) Prof. Shigeki Tokita (Institute for Chemistry, Kyoto University), "Advances in mid-infrared laser technologies: fiber and solid-state sources, ultrafast pulse generation, and emerging applications".
8) Prof. Takeshi Yasui (Institute of Post-LED Photonics, Tokushima University), "Optical frequency combs: unlocking high-precision optical sensing and advanced imaging".

The OPIC Banquet was held in the evening of April 23, after the Plenary Session, at the Ballroom of the Intercontinental Hotel adjacent to the Conference Hall. After an opening speech by the Congress Chair, Prof. Toyohiko Yatagai, the Banquet commenced 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 Congress Co-Chair, Prof. Kishan Dholakia. At the fully packed banquet hall, the participants engaged in free conversations. Starting

Fig. 4 Snapshot of conference banquet of OPIC2025.

this year, participation in the Banquet required a fee unless invited, but the number of participants was over 400, providing a meaningful opportunity for interaction between researchers. It was announced at the end of the Banquet that OPIC 2026 will be held from 21-25 April, 2026 at Pacifico Yokohama. Subsequently, we briefly report on operation, implementation, and summary of OPIC 2025.

2. Operation of OPIC2025

After 2023, when a complete recovery of the social system from COVID-19 was achieved, many major international academic conferences returned to 100% face-to-face meetings, and hybrid meetings with remote presentation have almost disappeared. This is partly because the operation cost for hybrid conferences is higher, and partly because face-to-face interaction is extremely effective for exchanging information between researchers.

At the start of OPIC2025 organization, we encouraged the invitation of not only Japanese co-chairs but also co-chairs from overseas to the Specialized International Conferences participating in OPIC2025, and strongly requested that the proportion of female and overseas members be increased on the steering committee and program committee.

In fact, due to increases in venue fees and other costs, OPIC was forced to raise its registration fees from 2025. However, this had almost no impact, and the number of participants and presented papers was commensurate with the number of international specialist conferences held, which is proof that the position of this conference is recognized.

This year, perhaps partially due to the weaker yen, the number of participants from overseas researchers increased (40.2% in total) and the number of presentations by students from overseas increased. Since time slots for oral presentations were limited at each conference, many Specialized International Conferences made effective use of poster presentations, with a total of 234 poster presentations taking place over the three days. To maximize attendee convenience, the presentation time schedules of Specialized International Conferences were synchronized, and conference attendance and access to abstracts were properly managed by the OPIC staff. Abstracts of all papers presented at OPIC2025 were available for download and access at the Web site by all registered attendees.

This year, following OPIC2022-2024, to further promote exchange between the international conference (OPIC) and the exhibition (OPIE), the OPIC enlightenment seminar titled "Latest Technology Trends" was held remotely on March 26-28 by 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 2025, 14 Specialized International Conferences were held by the conference chairs as shown in Table 1. The Specialized International Conferences used a common conference organization platform for call-for-papers, submissions, reviews and programs, and registration, which was developed through the management of previous OPIC conferences since 2012. Table 2 shows the numbers of the presented papers and the registered participants of the 14 Specialized International

Table 1 Specialized International Conferences in OPIC2025 and Conference Chairs

ALPS	The 14th Advanced Lasers and Photon Sources Hitoki Yoneda and Ruxin Li (China)
BISC	The 11th Biomedical Imaging and Sensing Conference Osamu Matoba, Yasuhiro Awatsuji, Yuan Luo (Taiwan), and Izumi Nishidate
FAAP	The Future of Agriculture and Advanced Photonics-The Fusion of Science and Technology for Sustainable Food Production Satoshi Wada
HEDS	International Conference on High Energy Density Science 2025 Ryouske Kodama and Natsumi Iwata
ICNN	International Conference on Nano-photonics, Nano-optoelectronics and Quantum Technology 2025 Yasuhiro Arakawa and Jonthan Finley (Germany)
LSC	Conference on Laser and Synchrotron Radiation Combination Experiment 2025 Toshihiko Shimizu
LSSE	Laser Solutions for Space and the Earth 2025 Satoshi Wada
META	Meta Photonics: Design, Fabrication, Characterization, and Applications Din Ping Tsai (Hong Kong) and Takuo Tanaka
OMC	The 11th Optical Manipulation and Structured Materials Conference Takashige Omatsu, Kishan Dholakia (Australia), and Sile Nic Chormaic
OPTM	Optical Technology and Measurement for Industrial Applications 2025 Rainer Tutsch (Germany), Toru Yoshizawa, and Yukitoshi Otani
OWPT	The 7th Optical Wireless and Fiber Power Transmission Conference Tomoyuki Miyamoto and Kayo Ogawa
SI-Thru	Sensing and Imaging through Scattering and Fluctuating Field in Biology, Telecommunication, and Astronomy Osamu Matoba and Sylvain Gigan (France)
TILA-LIC	Tiny Integrated Laser and Laser Ignition Conference 2025 Takunori Taira
XOPT	International Conference on X-ray Optics and Applications 2025 Tetsuya Ishikawa and Kazuto Yamauchi

Table 2 Summary of the numbers of presentations and registrants. The numbers in parentheses indicate the number of papers that were retracted.

	Number of prsentations				Number of registrants			
	Oral		Poster	Total	General	Student / Senior	Invited	Total
	Invited	Contributed						
Plenary	3			3			3	3
ALPS	38	90 (5)	96 (3)	224	87	109	71	267
BISC	9	36 (1)	27 (3)	69	39	40	9	88
FAAP	14	6 (1)	0	19	21	5	6	32
HEDS	23	15 (2)	13 (1)	48	28	10	24	62
ICNN	13	16	16	45	32	21	9	62
LSC	26	11 (1)	0	37	30	12	4	46
LSSE	22	5	0	27	43	1	4	48
META	5	27 (2)	0	30	29	10	0	39
OMC	12	45	8 (1)	64	42	22	12	76
OPTM	8	28 (1)	15 (1)	49	55	24	2	81
OWPT	11 (1)	18	5	33	34	24	4	62
SI-Thru	9	14	4	27	26	8	5	39
TILA-ILC	15	20	8	43	41	7	0	48
XOPT	7 (1)	28 (1)	40 (3)	70	64	25	11	100
Joint ALPS & HEDS & XOPT	3	0	0	3	0	0	0	0
Joint BISC & SI-Thru	3		2	5				
Tutorial	8			8			8	8
Sponsor							7	7
Congress & Exhibitor							84	84
Total	229	359	234	822	571	318	263	1152

Table 3 Number of participants by country. Categorized by country of origin, not by institution.

Countory	No.	ref. OPIC2024
Japan	689	857
China	118	103
Taiwan	94	96
Germany	40	48
United States of America	40	40
Korea	20	43
India	16	12
United Kingdom	14	13
France	11	15
Spain	11	8
Singapore	10	6
Sweden	10	2
Thailand	8	2
Italy	6	5
Poland	6	2
Canada	5	7
Viet Nam	5	5
Czech Republic	4	7
Lithuania	4	4
Russia	4	5
Belgium	3	2
Hong Kong	3	3
Indonesia	3	2
Turkey	3	
Australia	2	8
Chile	2	
Denmark	2	
Israel	2	1
Saudi Arabia	2	1
Bangladesh	1	2
Colombia	1	
Cuba	1	
Finland	1	2
Ireland	1	5
Malaysia	1	
Netherlands	1	1
New Zealand	1	2
Pakistan	1	1
Philippines	1	3
Romania	1	2
Switzerland	2	4
Syria	1	
Tanzania	1	
Others		18
Total	1152	1337

	Sum	%
Japan	689	59.8%
Foreign	463	40.2%

No. of Countries 43

Conferences. Detailed account of each conference will be reported separately in this and the following issues of The Review of Laser Engineering.

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 for free on the OPIC website. The 1 - 2-page abstracts of all papers were available to all participants on the web during the Congress.

4. Summary of OPIC 2025

OPTICS & PHOTONICS International Congress 2025 (OPIC 2025) and Optics and Photonics International Exhibition (OPIE2025) were held in April 21-25, 2025. In total, 822 papers were presented at the Plenary Session and 14 Specialized International Conferences. There were 1152 registered participants, spread across 43 countries, with 40.2% of participants coming from overseas.

We are confident that the organization and operation of OPIC2025 were successful, contributing to recognition of OPIC as a high-quality international conference on optics and photonics. We believe that OPIC can be the real face-to-face communication field for science and technology of optics and photonics. We must continue this work and support pioneering activities that nurture the seeds of academic technology and foster new industries.

5. Acknowledgement

We would like to thank all participants to OPIC 2025. We are very grateful to Dr. Shiro Yamakawa, Prof. Kenji Ohmori, Prof. R. J. Dwayne Miller for presenting the plenary lectures. We are also indebted to Congress Co-Chairs, Prof. Irina Sorokina, Prof. Kishan Dholakia, Prof. Din Ping Tsai, and Prof. Shuji Sakabe for providing advice and encouragement in organizing the OPIC2025.

We deeply appreciate Chairs, secretaries, and staff 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 2025. Also, thanks are due to the staff of OPIC management for their dedication to implementing OPIC.

We would like to thank

Ministry of Agriculture, Forestry, and Fisheries
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 Land, Infrastructure, Transport and Tourism (MLIT),
Japan Tourism Agency (JTA)
KEIDANREN (Japan Business Federation),
Japan Science and Technology Agency (JST),
New Energy and Industrial Technology Development Organization (NEDO)

for supporting OPIC 2025.

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),
Optoelectronic Industry and Technology Development Association (OITDA),
Institute for Laser Technology (ILT)
The Optical Society of Japan (OSJ)
Japan Photonics Council (JPC)
PIDA-Photonics Industry & Technology Development

Association (Taiwan)
Fraunhofer Institute for Laser Technology (ILT, Germany),
Photonics Media (USA),
OPTICA (Formerly OSA, USA),
for cooperation to organize OPIC 2025.

We would like to thank the financial supports from the following organizations:
The Amada Foundation
Nippon Sheet Glass Foundation for Materials Science and Engineering
National Institute of Information and Communications Technology (NICT)
Tsurugi-Photonics Foundation
Support Center for Advanced Telecommunications Technology Research Foundation
Yokohama Convention & Visitors Bureau

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
Optoquest Co., LTD.
QD laser

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