THE JAPAN PRIZE FOUNDATION

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Japan Prize News
No. 71 Jan. 2025

JAPAN PRIZE

2025 Japan Prize Laureates Announced

Prof. Russell Dean Dupuis

Professor,
Electrical and Computer Engineering, and Materials Science and Engineering,
Georgia Institute of Technology

USA

Fields Eligible for the Award:
Materials Science and Production

Development of metal-organic chemical vapor deposition technology for compound semiconductor electronic and optoelectronic devices, and pioneering contribution to its large-scale commercialization

The continued spread of personal computers, mobile phones, and other IT devices has ushered in the Information Age, and large volumes of data are now being exchanged constantly. A diverse array of devices and peripherals are used to support our information society, and they are made of parts that incorporate various semiconductor-based technologies. Semiconductors are materials that allow the flow of electrons to be controlled, and they are used in transistors and a multitude of other electronic devices with different properties. The combination of two or more elements allows for the creation of compound semiconductors which, due to the varied properties they hold, can be used to manufacture light-emitting diodes (LEDs), semiconductor lasers, solar cells, and various other electronic and optical devices.

Metal-organic chemical vapor deposition (MOCVD) is a widely-used technique that utilizes organometallic gases for the mass manufacture of compound semiconductor materials. In the 1970s, Professor Russell Dean Dupuis turned his attention to MOCVD as a means for fabricating compound semiconductor films, and he demonstrated that this method could be used to produce high-performance devices that could handle practical use. Dupuis' research paved the way for the mass production of compound semiconductor electronic and optical devices and their subsequent commercialization.

Prof. Carlos M. Duarte

Ibn Sina Distinguished Professor,
Biological and Environmental Science and Engineering Division,
King Abdullah University of Science and Technology

SPAIN

Fields Eligible for the Award:
Biological Production, Ecology/Environment

Contribution to our understanding of marine ecosystems in a changing Earth, especially through pioneering research on Blue Carbon

The oceans of the world provide humanity with a great variety of boons, but marine environments are deteriorating at an ever-increasing rate, which is having a negative impact on marine ecosystems.

Prof. Carlos M. Duarte is a leading researcher in marine ecosystems affected by global environmental change. His research into Blue Carbon (carbon absorbed by marine ecosystems) has been particularly effective in helping us understand the importance of the role of marine ecosystems as carbon sinks, providing new guidelines for global warming countermeasures, and contributing in many other ways as well.

Duarte discovered that one type of marine ecosystem in particular – areas with coastal vegetation comprised of seagrasses, mangroves, and other salt marsh plants – serves as the largest reservoir for blue carbon in the oceans. Blue carbon in these vegetated coastal habitats makes up roughly 50% of the total annual carbon burial in all ocean sediments, and it remains sequestered there for more than one thousand years. This makes it clear that vegetated coastal habitats are the most important ecosystems in the battle to prevent global warming .

However, vegetated coastal habitats are also the ecosystems most damaged by human activity, which is why Duarte is working to conserve and restore these habitats. Duarte argues that the key to a sustainable future is in utilizing the functionality of existing ecosystems, and that foresight serves as a beacon of hope for us all.

JAPAN PRIZE

The establishment of the Japan Prize was motivated by the Japanese government's desire to create an internationally recognized award that would contribute to scientific and technological development around the world. With the support of numerous donations, the Japan Prize Foundation received endorsement from the Cabinet Office in 1983.

The Japan Prize is awarded to scientists and engineers from around the world who have made creative and dramatic achievements that help progress their fields and contribute significantly to realizing peace and prosperity for all humanity.

Researchers in all fields of science and technology are eligible for the award, with two fields selected each year in consideration of current trends in scientific and technological development. In principle, one individual in each field is recognized with the award, and receives a certificate, a medal, and a monetary prize. Each Award Ceremony is attended by the current Emperor and Empress, heads of the three branches of government and other related officials, and representatives from various other elements of society.

Fields of Materials Science and Production

Achievement

Development of metal-organic chemical vapor deposition technology for compound semiconductor electronic and optoelectronic devices, and pioneering contribution to its large-scale commercialization

Prof. Russell Dean Dupuis (USA)
Born: July 9, 1947 (Age: 77)
Professor, Electrical and Computer Engineering, and Materials Science and Engineering,
Georgia Institute of Technology

Compound semiconductor devices as the backbone of information society

Silicon devices that perform computations are not the only devices that play a significant role in today's information society; there is also a need for electronic and optical devices made from compound semiconductors, which can handle light and radio waves.

Compound semiconductors are semiconductors made from two or more different elements. When building a compound semiconductor device, single-crystal films to a thickness of between a few nanometers and a few hundred nanometers are used (1 nanometer is equal to one-billionth of a meter) (Fig.1). Metal-organic chemical vapor deposition (MOCVD) is widely used in the large-scale commercial production of such films. For example, to fabricate a thin film of gallium nitride (GaN) or gallium arsenide (GaAs), trimethylgallium ($Ga(CH_3)_3$) and other organometallic compounds are turned into gas and fed into a reactor. It is from this that the process gets its name.

MOCVD and other methods such as liquid-phase epitaxy and molecular-beam epitaxy – all of which produce thin, single-crystal films by layering atoms as described above – are known as "epitaxial crystal growth" techniques. The 1970s saw a great amount of research being conducted into which of these techniques was most suitable for commercial production of compound semiconductors, and Dupuis focused his research on MOCVD.

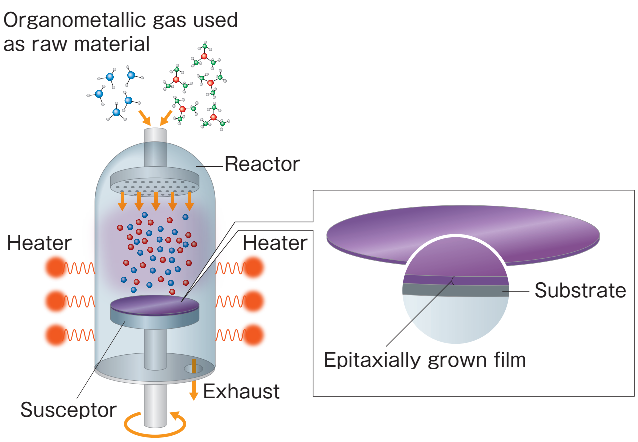


Figure 1: Schematic diagram of reactor used in MOCVD, and an image of a film formed using this technique.

What is metal-organic chemical vapor deposition (MOCVD)?

Figure 2 shows the MOCVD reaction for gallium arsenide, a typical compound semiconductor. Gallium arsenide allows for higher electron mobility than silicon, making it well-suited for use in high-speed communications, and it is also widely-used in infrared optical sensors used in television and air conditioner remote control devices.

During the production process, a mixture of organometallic trimethylgallium ($Ga(CH_3)_3$) gas and arsine (AsH_3) gas is supplied to a reactor and subjected to thermal decomposition. The pyrolysis of the vapor-phase mixture allows for deposition of a single-crystal film of gallium arsenide on the substrate. The formation of this film is precisely-controlled at the atomic level, and it can now perform the desired function, such as being used in optical sensors.

Harnessing raw materials in gaseous form, MOCVD is capable of producing large, flat films in a comparatively shorter time than other epitaxial crystal growth techniques. Moreover, MOCVD does not require an ultra-high vacuum to work, and has a number of other features that make it advantageous for use in mass production. However, a number of reports in the earliest days of MOCVD research claimed that it was difficult to use the technique to grow high quality films, so research into it lagged for a period of time.

Improvements in MOCVD equipment make large-scale commercial production possible

Dupuis conducted a detailed analysis of the crystal growth process in the early 1970s, and used what he

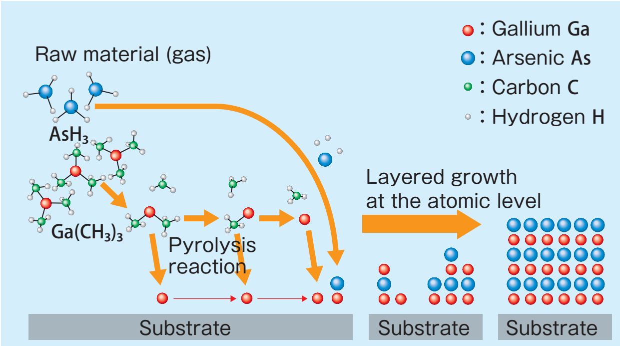
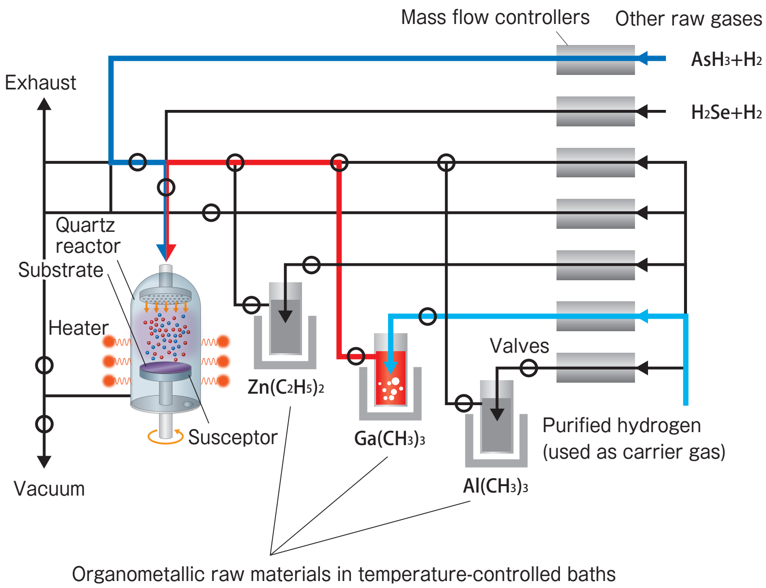


Figure 2: The MOCVD epitaxial growth process.
The gaseous raw material is subjected to thermal decomposition and leaving only the elements of interest to be grown as a crystalline film on the substrate.



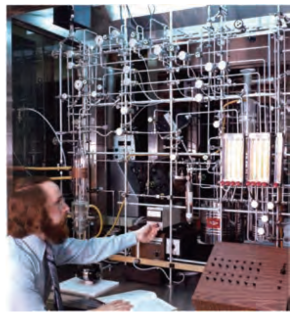


Figure 3: Dupuis' first MOCVD reactor at Rockwell International (photograph from October 1975) and diagram showing how the device was operated.

Hydrogen and nitrogen are used as carrier gases to transport the vaporized organometals, and the gaseous raw materials are supplied to the quartz reactor at a precise mixture rate by adjusting the flow rate with valves. Within the reactor, the raw material is subjected to thermal decomposition, leaving the elements of interest to form an epitaxial single-crystal thin film on a substrate.

Photograph source : R.D. Dupuis, *IEEE J. Sel. Top. Quantum Electron* 2000, 6 (6), 1040-1050.

discovered to improve his MOCVD system in various ways (Fig. 3). First, he made the piping used to transport the gas more efficient, and built a system that allowed him to quickly adjust the flow of gas. He also introduced all-welded gas supply bubblers of his own design to store the raw material, which ensured that the system was as clean and as leak-tight as possible. In addition, he used a computer to control the opening and closing of valves, allowing him to precisely control the composition of the raw gases and fabricate heterojunctions with two different compound semiconductors.

Through innovations like these, Dupuis was able to demonstrate that MOCVD could produce a high quality, uniform, defect-free film over a large area at high speeds. In 1977, he used a newly-constructed MOCVD system to build a double heterostructure with two semiconductors, gallium arsenide and aluminium gallium arsenide, in three layers, and thereby successfully demonstrated the world's first continuous operation of a laser at room temperature. Dupuis was also able to use the process to fabricate high efficiency solar cells and quantum well lasers, for which emission wavelength could be adjusted by changing the thickness of the film. His research demonstrated that MOCVD could be used in manufacturing semiconductor heterojunctions that could handle practical use, which then became the catalyst for its later use in commercial mass production.

Supporting the commercialization of new functionality demanded by society

Today, semiconductor lasers are widely-used in a variety of applications, from optical communications and DVD laser diodes to laser pointers and bar code scanners (Fig. 4). Some types of solar cells are also manufactured using the MOCVD technique developed by Dupuis.

These techniques are in particularly wide use in the manufacture of blue LEDs and other LEDs, which are used as lights around the world due to their ability to provide bright illumination with lower power consumption than conventional lighting options, and the market for MOCVD-produced LED lighting will surely continue to grow. Moreover, as compound semiconductors can be made by combining multiple elements to provide various different functions, it is expected that they will continue to contribute to the future development of new electronic and optical devices.

Professor Russell Dean Dupuis' breakthrough led to the commercialization of compound semiconductor production. It has become the foundation upon which our modern information society is built, and will continue to play an essential role in societal development into the future.

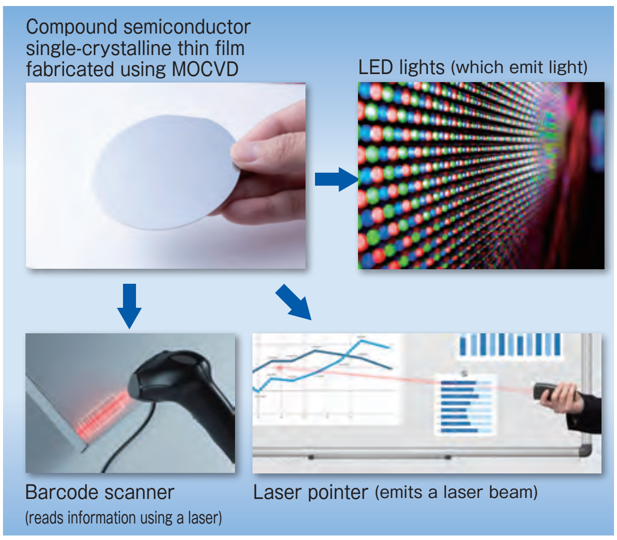


Figure 4: Some applications for compound semiconductors produced using MOCVD.

These are just a few of the many applications in which compound semiconductors can be used, with examples here including optical devices such as LEDs and semiconductor lasers.

Fields of Biological Production, Ecology/Environment

Achievement

Contribution to our understanding of marine ecosystems in a changing Earth, especially through pioneering research on Blue Carbon

Prof. Carlos M. Duarte (SPAIN)

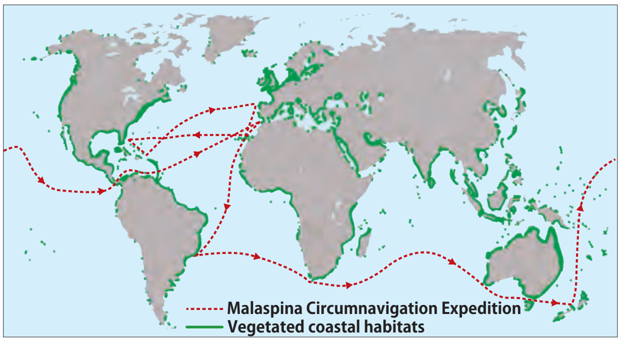
Born: July 27, 1960 (Age: 64)
Ibn Sina Distinguished Professor,
Biological and Environmental Science and Engineering Division, King Abdullah University of Science and Technology

The overall structure and current state of marine ecosystems

The oceans cover approximately 70% of the Earth's surface, and they provide humanity with various benefits by mitigating the effects of climate change, supplying us with marine resources, and more. However, human activity is having a grave impact on marine environments due to increased carbon dioxide (CO_2) emissions, the destruction of biospheres, and other issues.

Duarte's thorough research into marine ecosystems has provided us with a clearer understanding of their overall structure and the extent of human influence on marine organisms and ecosystems. His work stands as a major achievement in the field of marine biology and has been published in more than 1,000 academic papers, and now provides vital guidelines for finding solutions to global environmental problems.

Between 2010 and 2011, Duarte led the Malaspina Circumnavigation Expedition, a study of marine environments across the globe (Fig. 1). A total of 800 researchers from around the world participated in this voyage, and have provided reports on a great variety of discoveries, from the current level of plastic pollution in marine environments to the mysterious structures of deep-sea ecosystems.



Source for vegetated coastal habitats: https://www.thebluecarboninitiative.org/
Source for expedition route: Duarte, C. M., *Limnology and Oceanography Bulletin* 2015, 24(1), 11-14.

Figure 1: Map showing route of the Duarte-led Malaspina Circumnavigation Voyage and extent of vegetated coastal habitats.

Blue Carbon – Carbon absorbed by marine organisms

Duarte's research into Blue Carbon is particularly important.

Carbon on Earth moves between the atmosphere, land, and oceans by changing into CO_2, organic matter, fossil fuels, and other forms (Fig. 2). Roughly 30% of the CO_2 emitted through human activity is absorbed by the oceans, and while most is dissolved into seawater, some is absorbed by plants and incorporated into marine ecosystems as organic carbon. Duarte has given this type of carbon the name "Blue Carbon."

Blue Carbon is created and moved primarily in two ways. The first is through the food chain: phytoplankton that have photosynthetically absorbed carbon are eaten by zooplankton, which are subsequently eaten by fish and finally deposited on the seafloor as bodily waste and dead organisms. The second way is when carbon is absorbed by coastal vegetation, and subsequently deposited on the seafloor when the plants die. Blue Carbon then remains sequestered on ocean floors without returning to the atmosphere for more than 1,000 years.

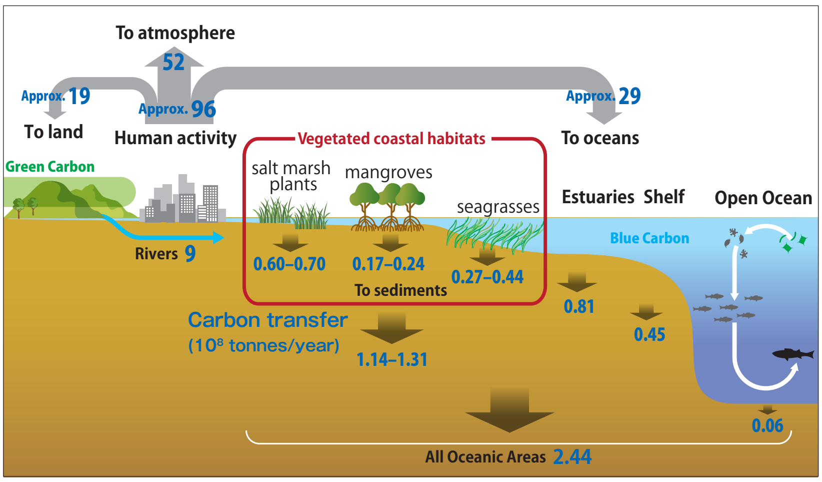


Figure 2: Carbon transfer pathways and annual transfer-amounts.

The burning of fossil fuels and other human activities result in the annual emission of approximately 9.6 billion tonnes of CO_2, of which roughly 2.9 billion tonnes are absorbed by the oceans. Some of the carbon transferred to the oceans is absorbed by ecosystems in the form of Blue Carbon and deposited on the ocean floor.

Sources:
Amount of carbon transferred to the atmosphere, land, and oceans: Friedlingstein et al., *ESSD* 2022, 14(11), 4811-4900
Amount of carbon transferred through rivers: IPCC Report (2013)
Blue Carbon sediment data: UNEP report on Blue Carbon (2009)

Vegetated coastal habitats are the largest store of Blue Carbon

Duarte calculated the amount of Blue Carbon deposited on the ocean floor as sediment in different regions, from coastal areas to the open ocean (Fig. 2), in order to clarify how much can be found in each. This led to the discovery that although the open ocean makes up more than 90% of total ocean area, it holds only a negligible amount of Blue Carbon. In contrast, Duarte found that while vegetated coastal habitats (Fig. 1) populated by salt marsh plants, mangroves, and seagrasses (Fig. 3) account for only 0.5% of total ocean area, they account for the equivalent of 50% of the total annual carbon burial in marine sediments. It was also confirmed that Blue Carbon deposited in vegetated coastal habitats is transferred to and deposited in neighboring marine regions by water currents. In other words, vegetated coastal habitats absorb, store, and sequester carbon in the marine environment, and serve as the largest reservoir of Blue Carbon.

The role played by vegetated coastal habitats was still unknown when Duarte released his research, and it shocked the world. A 2009 United Nations Environment Programme (UNEP) report listed Blue Carbon as a new option for addressing global warming alongside Green Carbon, or carbon absorbed by terrestrial plants, and it pointed out the particular importance of vegetated coastal habitats as carbon sinks. Vegetated coastal habitats are now recognized as the "most important biospheres" in the fight to mitigate global warming.

Conserving and restoring marine ecosystems for the future

Vegetated coastal habitats serve not only as stores for Blue Carbon, but also have rich biodiversity, help nurture invertebrate larvae and juvenile fish that grow to become marine resources, and protect coastal land from strong winds and high waves.

However, as these habitats lie on the boundary between sea and land, they are easily affected by human activity, and land reclamation and other projects have resulted in the continuous destruction of these ecosystems. By 2009, the area covered by vegetated coastal habitats had decreased to between one-half and two-thirds of the area that existed in the 1940s, and that area continues to shrink (Fig. 4).

That being said, Duarte argues that "It's not too late," and he is putting in an active effort towards conserving and restoring vegetated coastal habitats. In collaboration with UN agencies and other organizations, a total of 50 marine sites have been registered on the UNESCO World Heritage List. Recently, Duarte has also been working to promote the incorporation of vegetated coastal habitats into economic systems as "natural capital."

Duarte's own experiences have led him to the belief that the world stands at a crossroads today, and that the key to a sustainable future lies in harnessing the functionality of existing marine ecosystems. Prof. Carlos M. Duarte's research into Blue Carbon and other work are a beacon of hope for the future, and an opportunity to expand the conservation and restoration of marine ecosystems.

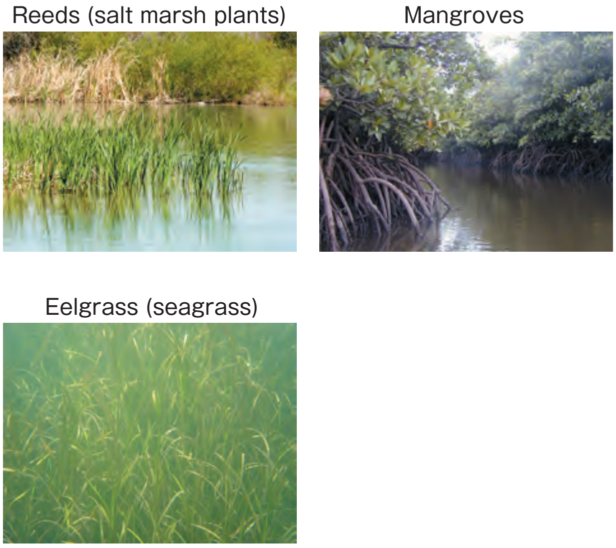
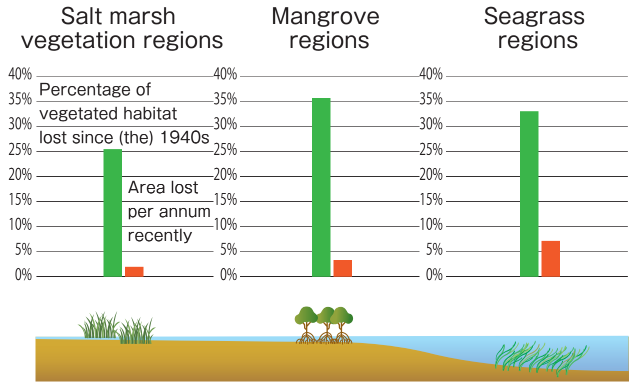


Figure 3: Typical plants that absorb Blue Carbon in vegetated coastal areas.

Source: Mangrove and eelgrass photographs provided by Japanese Fisheries Research and Education Agency



Source: Nellemann, C., et al. (2009). Blue Carbon: The Role of Healthy Oceans in Binding Carbon

Figure 4: Percentage of salt marsh, mangrove, and seagrass habitat areas lost.

Percentage of vegetated habitat lost since (the) 1940s (green bars). Each of these regions has decreased to between one-half and two-thirds of the area that existed in the 1940s. Recent years (2009) have seen habitats continue to shrink (percentage shown with orange bars).

Nomination and Selection Process

- Every November, the Field Selection Committee of The Japan Prize Foundation designates and announces two fields in which the Japan Prize will be awarded two years hence. At the same time, the Foundation calls for over 15,500 nominators, strictly comprised of prominent scientists and researchers from around the world invited by the Foundation, to nominate the candidates through the Web System. The deadline for nominations is the end of January of the following year.
- For each field, a Selection Subcommittee conducts a rigorous evaluation of the candidates' academic achievements. The conclusions are then forwarded to the Selection Committee, which conducts evaluations of candidates' achievements from a wider perspective, including contributions to the progress of science and technology, and significant advancement towards the cause of world peace and prosperity, and finally the selected candidates are recommended for the Prize.
- The recommendations are then sent to the Foundation's Board of Directors, which makes the final decision on the winners.
- The nomination and selection process takes almost two years from the time that the fields are decided. Every January, the winners of that year's Japan Prize are announced. The Presentation Ceremony is held in April in Tokyo.

2023				2024		2025	
July - October	November		January		November	January	April
1 →	2	3 →	4	5 →	6	7	8

1. Consider the eligible fields for the 2025 Japan Prize (Board of Directors)
   Materials Science and Production
   Biological Production, Ecology/Environment
2. Determine the eligible fields for the 2025 Japan Prize (Board of Directors)
3. Invite the nominations
4. Closing of the nominations
5. Japan Prize (Selection Committee)
   Materials Science and Production (Selection Subcommittee)
   Biological Production, Ecology/Environment (Selection Subcommittee)
6. Selecting the Laureates of the 2025 Japan Prize (Board of Directors)
7. Announce the Laureates of the 2025 Japan Prize
8. The 2025 Japan Prize Presentation Ceremony

Members of the 2025 Japan Prize Selection Committee

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President, RIKEN
Former President, The University of Tokyo

Deputy Chairperson

Hiroyuki Mano
Director
National Cancer Center Research Institute

Members

Mariko Hasegawa
President, Japan Arts Council
Professor Emeritus, The Graduate University for Advanced Studies, SOKENDAI

Norio Kawakami
Vice Program Director, Fundamental Quantum Science Program,
TRIP (Transformative Research Innovation Platform), RIKEN
Professor Emeritus, Kyoto University

Masayuki Matsushita
Director
The Japan Prize Foundation

Yasutaka Moriguchi
Director, The Japan Prize Foundation
Representative Director
The Japan Foundation of Public Communication on Science and Technology

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University of Tsukuba

Hideyuki Okano
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Director, Keio University Regenerative Medicine Research Center

Tatsuya Okubo
Presidential Advisor, The University of Tokyo
Professor, School of Engineering, The University of Tokyo

Hiroto Yasuura
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Inter-University Research Institute Corporation,
Research Organization of Information and Systems
Professor Emeritus, Kyushu University

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Fundamental Quantum Science Program
TRIP (Transformative Research Innovation Platform), RIKEN
Professor Emeritus, Kyoto University

Deputy Chairperson

Yuichi Ikuhara
Distinguished Research Professor
The University of Tokyo

Members

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Graduate School of Advanced Science and Engineering, Hiroshima University
Professor Emeritus, Tokyo Institute of Technology

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Professor Emeritus, Kyoto University

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Organization for Research Advancement, Tokyo University of Science
Professor Emeritus, The University of Tokyo

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Professor Emeritus, The University of Tokyo

Hideyuki Yasuda
Professor, Graduate School of Engineering, Kyoto University

Specialist

Hidemitsu Furukawa
Professor, Graduate School of Science and Engineering,
Yamagata University

Tesuo Kondo
Professor, Enviro-sustainable materials science Lab (Endowed Chair),
Institute of Agriculture, Tokyo University of Agriculture and Technology

Selection Subcommittee for the "Biological Production, Ecology/Environment" fields

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Japan Arts Council
Professor Emeritus
The Graduate University for Advanced Studies, SOKENDAI

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Yoh Iwasa
Professor Emeritus
Kyushu University

Members

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Professor Emeritus, Tohoku University

Masakado Kawata
President-Appointed Extraordinary Professor
Institute for Liberal Arts and Science, Tohoku University

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Department of Food Science and Technology, Nihon University

Kazutaka Mogi
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School of Veterinary Medicine, Azabu University

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School of Environment and Society, Institute of Science Tokyo

Sakae Shibusawa
WISE Program Professor, Organization for WISE Program,
Tokyo University of Agriculture and Technology

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Professor Emeritus, The University of Tokyo

Hirokazu Toju
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Shin-ich Uye
Professor Emeritus, Hiroshima University

Izumi Washitani
Professor Emeritus, The University of Tokyo

Specialist

Shinji Fukuda
Project Professor
Institute for Advanced Biosciences, Keio University

Takeshi Nakano
Professor, Graduate School of Biostudies, Kyoto University

Nobuko Saigusa
Director,
Earth System Division, National Institute for Environmental Studies

Hiroshi Shimizu
Professor
Graduate School of Information Science and Technology, Osaka University

Yu Tanaka
Associate Professor
Faculty of Environmental, Life, Natural Science and Technology, Okayama University

(Names listed in alphabetical order. Titles and positions are valid as of January 2025)

Eligible Fields for the 2026 Japan Prize

Areas of Physics, Chemistry, Informatics, and Engineering
Electronics, Information, and Communication

Background and Rationale:

Recent years have witnessed the explosive spread of computers and smartphones, rapid growth of the internet, and dramatic advances in semiconductor technologies all over the world. The development of electronic, informatics, and communications technologies has helped to improve information processing and communication efficiency, productivity, and quality of life to a striking extent. In addition, rapid advances in data analysis and simulation technologies in physics, chemistry, life sciences, and other fields of research have led to improved experimental accuracy and to new discoveries, which have contributed greatly to the overall advancement of science and technology. Such technologies are becoming increasingly important as they form more of society's essential infrastructure. Future advances in AI, quantum computing, 5G communications, and quantum communications technologies are expected to lead to further evolution of industrial automation and advanced data processing, and to contribute immensely to the development of IoT-based smart cities.

However, our constantly changing information society will require cybersecurity to play an increasingly vital role in establishing a safe and secure environment, in building a society that is sustainable, and in promoting economic growth. The rapid development of AI has led to the emergence of issues related to energy consumption, more awareness of ethical issues, and more, and these too must be addressed.

Eligible Achievements:

The 2026 Japan Prize in the fields of Electronics, Information, and Communication will be awarded for any of a wide array of achievements that have enormous potential to lead to breakthrough advances in science and technology. Potential winners will have conducted research that could lead to the creation of new industries and innovation of manufacturing technologies, aid in the evolution of information society, ensure societal safety and security, or promote the development of fundamental technologies and systems that contribute to improving quality of life.

Areas of Life Sciences, Agriculture, Medicine, and Pharmacology
Life Sciences

Background and Rationale:

From the moment the genome was deciphered, our understanding of life's basic principles and the diversity of functions of living organisms, from bacteria to human beings, has improved markedly. Drawing on growing knowledge of how molecules work together and constitute life, scientists are finding answers to their queries regarding such mechanisms at the individual cell level as gene expression control/epigenetics and self-organization/organogenesis during development and differentiation. At the level of individual organisms, the manner in which the nervous system, the immune system, and metabolism are interrelated is coming to light. At the level of ecosystems, we are coming to understand better how molecules mediate the exchange of information among organisms. Research on model organisms and on organisms in the natural world is throwing light on mechanisms of processes ranging from ontogenesis/phylogenesis to aging, evolution, symbiosis, and adaptation to environmental changes. Our deepening understanding of life also owes much to more advanced technology in structural biology, biophysics, chemical biology, and synthetic biology as well as to improvements in imaging technology, single-cell analysis, and analysis of biological big-data. Through these advances at multiple, ever-higher levels, from molecules to cells, to tissues, to individuals, and to populations (ecosystems), it is becoming easier to understand life as a system. We count on further contributions to a sustainable society and humanity's well-being that are consistently mindful of bioethics and that will establish on a firm basis both the global environment and human health by elucidating the mechanisms of biological phenomena.

Eligible Achievements:

The 2026 Japan Prize in the Life Sciences will reward achievements marking epochal advances in scientific technology that make significant contributions to society through discoveries of previously unknown biological phenomena and through work elucidating regulatory mechanisms, as well as through technical innovations that promise a deeper understanding of living organisms' functioning in nature.

Fields Selection Committee for the 2026 Japan Prize

Chairperson

Kohei Miyazono
Executive Director, RIKEN
Distinguished University Professor, Department of Applied Pathology, Graduate School of Medicine, The University of Tokyo

Vice Chairperson

Kazuhito Hashimoto
President
Japan Science and Technology Agency

Members

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Professor, Faculty of Pharmaceutical Sciences, Teikyo University
Visiting Researcher, Graduate School of Medicine, The University of Tokyo

Mutsuko Hatano
Executive Vice-President, Institute of Science Tokyo
Professor, School of Engineering, Institute of Science Tokyo

Kazuhiro Hono
President
National Institute for Materials Science (NIMS)

Jinichi Igarashi
Former Representative Director, President, ENEOS Research Institute, Ltd.
Former Director, Senior Vice President
JXTG Nippon Oil & Energy Corporation

Erina Kuranaga
Professor, Graduate School of Life Sciences, Tohoku University
Professor, Graduate School of Pharmaceutical Sciences
Kyoto University

Tadahiro Kuroda
University Professor, Office of University Professors
The University of Tokyo
Chancellor, Prefectural University of Kumamoto

Yukiko Motomura
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Faculty of Life and Medical Sciences, Doshisha University

Toru Nakano
Professor Emeritus
Osaka University

Taikan Oki
Professor
Graduate School of Engineering, The University of Tokyo

Nobuhiro Tsutsumi
Vice President, The University of Tokyo
Professor, Graduate School of Agricultural and Life Sciences
The University of Tokyo

Naonori Ueda
Deputy Director, RIKEN Center for Advanced Intelligence Project
Research Professor (Visiting Fellow)
NTT Communication Science Laboratories

Minoru Yoshida
Executive Director, RIKEN
University Professor, Office of University Professors,
The University of Tokyo
Emeritus Professor, The University of Tokyo

(Names listed in alphabetical order. Titles and positions are valid as of November 2024)

Schedule (2026-2028)

The eligible fields for the Japan Prize (2026 to 2028) have been decided for the two research areas, respectively.
These fields rotate every year in a three year cycle. Every year the Fields Selection Committee announces the eligible field for the next three years.

Areas of Physics, Chemistry, Informatics, and Engineering

Year	Eligible Fields
2026	Electronics, Information, and Communication
2027	Resources, Energy, Environment, and Social Infrastructure
2028	Materials Science and Production

Areas of Life Sciences, Agriculture, Medicine, and Pharmacology

Year	Eligible Fields
2026	Life Sciences
2027	Medical Science and Pharmaceutical Science
2028	Biological Production, Ecology/Environment

Projects of the Foundation

For the further development of science and technology...

In addition to selecting and awarding the Japan Prize, the Japan Prize Foundation is engaged in projects designed to contribute to the development of science, technology, and society, including the offering of research grants for the training of young scientists, and our "Easy-to-understand Science and Technology Seminars" aimed at the children who will lead the coming generations.

JAPAN PRIZE

The creation of the Japan Prize was motivated by the Japanese government's desire to "contribute to the development of science and technology worldwide by establishing a prestigious international award." The Japan Prize was established in 1983 with a cabinet endorsement and is supported by numerous private donations.

The award honors scientists and researchers from around the world, recognizing individuals who have contributed significantly to the peace and prosperity of humankind through original and outstanding achievements that have greatly advanced the progress of science and technology.

Researchers working in all fields of science and technology are eligible to receive the Japan Prize. Each year, it is awarded for achievements in two fields, which are selected by considering recent developments in science and technology. As a general rule, one award is given for each field and each laureate receives a certificate of merit, a prize medal, and prize of 100 million yen.

The Presentation Ceremony is held annually in the presence of Their Majesties the Emperor and Empress of Japan and is also attended by the Prime Minister, the Speaker of the House of Representatives, the President of the House of Councillors, the Chief Justice of the Supreme Court, numerous government ministers, and eminent figures from various other areas.

Research Grants

The Heisei Memorial Research Grant Program is named after Their Majesties the Emperor Emeritus and Empress Emerita, who have been interested in the research activities of young scientists and have encouraged them for many years.

The Foundation primarily provides research grants to scientists under 45 years of age. The Foundation annually selects four to eight scientists engaged in research that transcends the boundaries between different fields and disciplines and contributes to solving social issues. They are then provided with grants worth five to ten million yen.

The Heisei Memorial Research Grant was established as a means of expressing our profound appreciation to their Majesties the Emperor Emeritus and Empress Emerita for their great generosity in granting this award.

(Applicants must belong to a research organization in Japan to be eligible for a grant.)

"Easy-to-Understand Science and Technology Seminars"

The Foundation holds various seminars for students and other members of the public. These seminars are conducted by experts who use plain language to explain the advanced technologies commonly used in everyday life.

More than 300 seminars have been held since the program was launched in March 1989.