

# The Chemical Society of Striving for Chemical Sciences and for a Sustainable Human Society



**Mitsuo Sawamoto**

Executive Director, The Chemical Society of Japan. Born in Japan (1951), he received his B.Sc. (1974), M.Sc. (1976), and Ph.D. (1979) in polymer chemistry from Kyoto University. After postdoctoral research at the University of Akron, USA (1980–81), he joined the Department of Polymer Chemistry, Kyoto University. In 2017, upon retiring from Kyoto, he joined the Frontier Research Institute at Chubu University. He serves as an Executive Program Director at the Japan Science and Technology Agency (JST), Member of the Science Council of Japan (SCJ), Executive Director of the Chemical Society of Japan, and Chair of the International Organizing Committee Pacificchem 2021. He has published over 540 research papers, 50 reviews and book chapters, and 46 patents (with nearly 25,000 citations and an h-index of 71) in the areas of precision cationic and radical polymerizations, metal polymerization catalysts, precision synthesis of designed functional polymers, and sequence regulation in chain-growth polymerization. His long list of Awards and Honors includes the Arthur K. Doolittle Award of the ACS, the Macro Group UK Medal, the SPSJ Award for Outstanding Achievement in Polymer Science and Technology, the NIMS Award on Strong Future of Soft Materials, the 2015 Medal of Honor with Purple Ribbon (presented by Emperor Akihito and Prime Minister Shinzo Abe, Japan), the Alexander von Humboldt Research Award, and the Benjamin Franklin Medal in Chemistry (USA).




## Brief History

The Chemical Society of Japan (CSJ), with a long history extending over 140 years and a membership of ca. 24,000, is one of the world's largest, most active, and internationally recognized societies in chemistry. The history of CSJ dates back to 1878 (just ten years after the Meiji Restoration, where Japan was reborn), when about twenty motivated and enthusiastic young scholars launched a small organization, the Chemical Society, in Tokyo for the advancement of chemistry. In the following year the embryonic society was renamed The Tokyo Chemical Society and eventually the current name, The Chemical Society of Japan, in 1921.

In 1948, shortly after the World War II, the then CSJ merged with the Society of Chemical Industry, founded in 1898, into an integrated organization with the same name: "The Chemical Society of Japan". The integration was in part symbolic in defining the renewed CSJ's perspective: CSJ consists of comparable numbers of individual members from both academia and industry along with supporting company affiliates; its activities cover virtually all segments of pure and applied chemistry along with diverse interdisciplinary areas now extended to physics, biology, medicine, materials, and advanced technology.

Since 2011 CSJ is a public interest incorporated association, a nonprofit tax-exempt organization legitimately certified and under the jurisdiction of the Japanese Cabinet.



# Japan: Technology

By Mitsuo Sawamoto  
<https://doi.org/10.51167/acm00017>

## Missions

The prime mission of CSJ is to promote chemical sciences and technology in collaboration with other domestic and global chemistry-related societies and associations. Above all, the overriding objective is thus to contribute to the betterment of human life. The recently redefined CSJ mission statement goes: The Chemical Society of Japan, with diverse members in academia, industry, and government, will internationally play leading roles in promoting the progress in state-of-the-art fundamental research and the implementation of developments in chemical science and technology, and will thereby contribute to building a sustainable human society.

In his inaugural address in June 2020, CSJ President Yoshimitsu Kobayashi said in excerpt: “The global society currently faces

three unprecedented trends: globalization, digitalization (or AI proliferation), and socialization. All three have the potential to rapidly overturn existing paradigms. Also, as we prepare for the challenges to come, we must continue to stay focused on the existing global challenges before us, namely global climate change, marine plastics, food and water shortages, and the yet uncontained COVID-19 pandemic.

“As CSJ President, I believe that the vital missions of **chemistry** and our Chemical Society are to respond quickly and sensitively to these fast-developing trends and thereby to provide **solutions** for global challenges. In retrospect, the Japanese chemical industry’s bitter history in the 20th Century as a major aerial and oceanic polluter resulted in invaluable lessons learned. The industry, in turn, applied its knowledge and technology thus acquired to develop strategies

to prevent environmental hazards, eventually transitioned to a **solution provider**, and has successfully played active roles in multiple environmental improvement efforts, including the revitalizing crystal-clear blue oceans, firefly-living fresh water, and clean air. I believe that, through the **power of chemistry**, the industry as solution provider will be at the forefront to find solutions to all worldwide challenges and thereby to establish a sustainable society.”

## Organization

The CSJ membership, total ca. 24,000 as of 2020, includes individual regular members in academia (ca. 9600) and industry (ca. 3700), student members (ca. 4300), teachers (ca. 1550), supporting company affiliates (420+), and institutional members

(such as libraries ; ca. 360). International membership grows steadily, particularly from China, Korea, and other Asian countries.

The CSJ Office operates by the Board of Directors and the Secretariat: The Board of Directors is the second highest decision-making, management organization, under the CSJ General Assembly, and consists of President, Senior Vice President, four Vice Presidents, Executive Director, General Secretary, 19 Directors, and four Auditors. The CSJ President, serving a two-year term, is elected by online general election by all the regular members; the position alternates for two consecutive terms from academia and the following third term from industry. The current President for fiscal 2020-2022 is Dr. Yoshimitsu Kobayashi (Figure 1), the Mitsubishi Chemical Holdings, and the President-Elect is Professor Hiroaki Suga, the University of Tokyo.



**Figure 1. CSJ President: Dr. Yoshimitsu Kobayashi, Mitsubishi Chemical Holdings**

Organizationally, the CSJ comprises of a Secretariat (Headquarters), Departments, and Regional Sections. The CSJ Secretariat consists of about 20 staff members, under Executive Director, Secretary General, and three Managers who work in three Sections (General Affairs; Projects, Meetings, and International Exchange; and Publications and Information) related to the Departments described below; the General Affairs Section also deals with the Society's finance. The CSJ Headquarters is located in a central academic area (Ochanomizu) of metropolitan Tokyo in the Chemistry Hall, a CSJ-owned building inaugurated in 1991 by members' contributions and wholly renovated just last year in 2020 (Figure 2).

The Departments are CSJ's functional organizations: General Affairs, Research Exchange, Publications and Information, Academia-Industry Exchange, and Education and Public Relations). In accordance with their functions, these Departments hold total about



**Figure 2. The Chemistry Building: The CSJ Headquarters and offices**

30 Committees, such as Membership, Award Selection, International Exchange, Journal Publication, Research Promotion, etc.

In addition to these Departments and Committees, since 2018 the CSJ comprises 21 Divisions for virtually all specific fields in chemistry, including analytical, inorganic, organic, macromolecular, and others. In parallel with Divisions are five Topical Groups, self-supporting research organizations currently focused on Colloids and Interfacial Chemistry, Chemo-informatics, Biofunctional Chemistry, Biotechnology, and Organic Crystals.

Seven Regional Sections cover local CSJ activities geographically extended all over Japan. The Kanto Section (metropolitan Tokyo and its vicinity) is the largest with ca. 50 % of all CSJ membership; the Kinki (Osaka, Kyoto, Kobe, and vicinity) and the Tokai (centered in Nagoya) Sections are the second and the third largest Sections, respectively. Each Regional

Section runs a variety of activities including local membership promotion, regional symposia, and outreach events for young potential chemists (children and school pupils) and the general public in the region.

The annual operating budget of CSJ in fiscal 2020 is about one billion Japanese yen (JPY) or nine million US dollars (USD), where the primary revenue comes from the membership fees (regular, student, and company affiliate fees).

### Activities

**Meetings.** The CSJ holds two annual meetings: the CSJ Spring Annual Meeting in March and the CSJ Chemistry Festa in October. The Spring Meeting (Figure 3), perhaps one of the most important CSJ activities, usually involves ca. 8,000 participants and over 6,000 oral and poster papers presented in general sessions and special symposia, expositions, and



Figure 3. CSJ Spring Annual Meeting: Lectures and poster sessions

public outreach events, where the General Assembly, Presidential lecture, and the Award Presentation Ceremony are also held.

In contrast, the Chemistry Festa focuses on academia-industry exchange and collaboration, where a majority of the organizing committee members accordingly come from the industry. Coupled with carefully selected special topic symposia, exhibitions, and human networking events, the Festa provides excellent opportunities for industry-academia collaboration and for student job-hunting and recruiting.

Along with the two annual nationwide meetings, the headquarter Departments and the Regional Sections organize a variety of symposia and workshops throughout a year.

**Publications.** CSJ actively and internationally publishes two journals, two societal organs, and books (Figure 4). The two peer-reviewed journals are monthly published online in English. *Bulletin of the Chemical Society of Japan* (BCSJ), launched in 1926, publishes original articles, reviews, and accounts, in total ca. 200 papers per annum, with an impact factor 5.448 as of

2020, which steadily rising. *Chemistry Letters* (CL or **ChemLett**), launched in 1972, is for rapid current-awareness communications and short reviews, monthly with ca. 400 papers a year, with impact factor 1.389 as of 2020.

The two organs, both primarily in Japanese and partially electronic, are windows to its members. *Kagaku to Kogyo* (**Chemistry and Industry**) is the CSJ's primary monthly organ delivered online and by mail, and free of charge to all the members. It features hot-topics accounts, Regional Section and CSJ Division reports, meeting announcements, messages to the members, and help-wanted advertisements. *Kagaku to Kyoiku* (**Chemistry and Education**), as its title implies, is primarily directed to school teachers and those who interested in chemistry education. It focuses on fundamental topics in chemistry (such as the IUPAC-authorized periodic table and atomic weights, SI units, etc.), new experiment programs developed by the members, and reviews.

In addition, *The Chemical Record and Chemistry: An Asian Journal* are joint publications with Wiley-VCH, covering more or

less personal research accounts. With several overseas chemistry-related societies, the CSJ has recently joined publishing a so-called preprint journal, **ChemRxiv**<sup>TM</sup>, to follow a current trend of non-peer-reviewed online publication for the rapid exchange of ever proliferating research information.

The CSJ also publishes books, such as *Kagaku Binran* (Chemistry Handbook), an authoritative compilation of chemistry data, and *CSJ Current Reviews*, a series of monographs covering hot topics, now in about 50 volumes.

**Awards and Research Grants.** For recognition of members' achievements and societal service, The Chemical Society annually presents ten awards, including the Award of the Chemical Society of Japan (the highest honor of research achievement), the Award for Creative Work, the Award for Young Chemists, the Award for Technical Development, the Award for Outstanding Young Women Chemists, and the Award for Chemical Education.

Based on the private endowment by the 2019 Nobel Prize in Chemistry laureate, the Akira Yoshino Research Program provides a



Figure 4. CSJ publications: Journals, organs, and books: (first row from left) *Bulletin of the Chemical Society of Japan*, *Chemistry Letters*, *Kagaku to Kogyo*, *Kagaku to Kyoiku*; (second row from left) *The Chemical Record*, *Chemistry: an Asian Journal*, *Kagaku Binran*, *CSJ Current Review*.

funding to a selected proposal on the topics annually specified by the donor, such as novel materials for lithium-ion batteries.

In 2021, based on another private legacy endowment fund, CSJ has set a brand-new award, the Saburo Nagakura Award named after the donor, an honorary Society member, to recognize and promote a promising researcher either in academia or industry with original, creative, and novel research, development, and/or education. For the first time for the Society, the award presents a non-restricted cash prize of 10 million Japanese yen (ca. 100 thousand USD) to a single recipient a year to be selected from the awardees of the afore-mentioned CSJ Awards except for the Award of the Chemical Society of Japan.

**International Exchange.** Quite naturally, the CSJ actively commits to international exchange activities (Figure 5) in collaboration with the chemistry-related societies and organizations worldwide, including the American Chemical Society (ACS), the Canadian Society for Chemistry (CSC), the Chinese Chemical Society (CCS), the Chemical Research Society of India (CRSI), the Chemical Society Located in Taipei (CSLT), German Chemical Society (GDCh), the Israel Chemical Society, (ICS), Korean Chemical Society (KCS), the New Zealand Institute of Chemistry (NZIC), the Royal Australian Chemical Institute (RACI), the Royal Society of Chemistry (RSC), and many others.

The Japanese Chemical Society is an active member of international chemistry organizations, such as the International Pure and

Applied Chemistry (IUPAC) and the Federation of Asian Chemical Societies (FACS) (Figure 5).

The CSJ, ACS, and CSC are the three founding societies of the International Chemical Congress of Pacific Basin Societies (Pacifichem). This Congress, held in every five years in Honolulu, HA, USA, is perhaps one of the largest and most comprehensive chemistry congresses with over 15,000 participants, co-organized by the seven Pacific Rim chemical societies (the founding members with CCS, KCS, NZIC, and RACI). Another interesting activity is the Chemical Sciences and Society Summit (CS3), a series of symposia jointly held by pairs of a chemical society and a funding agency in China, Germany, Japan, UK, and USA; the Japanese pair consists of CSJ and the Japan Science and Technology Agency (JST). Every 2-3 years CS3 provides a forum to discuss topics important for chemistry relative to the world society, such as sustainability, environment, climate change, water, etc., and the next meeting will be hosted by CSJ and JST.

With the Korean (KCS) and the Taipei (CSLT) partners, the CSJ holds a bilateral exchange agreement. Alternatingly every year, one partner society invites the president and/or younger chemists of the other to its annual meeting for lectures and human networking.

**Outreach.** To foster next generation chemists and strengthen the relationship with the general public, the CSJ Headquarters and the Regional Sections regularly hold outreach

events open to the public and particularly to school children and pupils. Of particular interest is the "I-Love-Chemistry Club" meeting, featuring chemistry experiments for kids, exhibitions, and Q&A sessions. To the delight of the CSJ members, juvenile participants show intense curiosity in chemical science and ask tough questions that often puzzle the instructors. For example, they may ask "Why does an orange-flavored jelly that looks a soft solid soon melt in our mouth and taste sweet?" To answer such questions, instructors cannot use any technical terms, however commonly used by professional chemists, such as hydrogel and hydrogen bonding.

### Future Perspective

The CSJ has been consistently active and steadily growing in promoting the progress in chemical science and technology. Its activities have been expanding in scope to encompass not only chemistry per se but a wide variety of related fields as biology, physics, medicine, pharmacy, and materials science. As stated above in the CSJ's missions, Chemistry for Sustainable Society and the World is an eminently important mission. As an expert group of professionals in molecules, substance transformation, materials creation, and process innovation, the Chemical Society of Japan has decided to meet the global challenges with concrete, viable, and implementable solutions, including sustainability, resilience, energy demand, food and water supply, global warming, and preserving the environment. ◆



**International Chemical Congress of Pacific Basin Societies (PACIFICHEM)**  
Joint Chemical Congress held every five years since 1984 in Honolulu, Hawaii, Co-sponsored by Chemical Societies in USA, Canada, China, Australia, NZ, and Japan.  
The 7<sup>th</sup> Congress, in 2015 attracted 15,800 attendees from all over the globe. CSJ will host the 8<sup>th</sup> Congress to be held December 15<sup>th</sup>-20<sup>th</sup> 2020.

**International Union of Pure and Applied Chemistry (IUPAC)**  
**Federation of Asian Chemical Societies (FACS)**  
The objective of the FACS (30 member nations in Asia) is stated in its Statutes as "to promote the advancement of chemistry and the interest of professional chemists in the Asia-Pacific region in a way that does not detract from the autonomy of any of the member societies". 18ACC will be held in Taipei.

**Chemical Science and Societies Symposium (CS3)**  
**Bilateral corporation agreement with China, RSC and Taiwan**  
China-Japan Young Chemists Forum, RSC-CSJ Joint Symposium  
CSLT-CSJ Joint Symposium

**Cooperation with foreign chemical societies:**  
ACS, RSC, GDCh, CCS, KCS, CSC, and others

**Japan-Europe Science, Technology & Innovation Symposium**

Figure 5. CSJ's international activities