



IChO2021 Catalyzer

No. **0**
January
2021

53rd International Chemistry Olympiad, Osaka, Japan

Welcome Message

The 53rd International Chemistry Olympiad IChO2021 will be held in Osaka, Japan, from Saturday, July 24 to Monday, August 2, 2021. On behalf of the Organizing Committee, I look forward to welcoming many talented high school students who love chemistry to Japan.

Chemistry is all around us as the central science. Chemistry has a mission to create new materials. Chemistry is the only scientific discipline that can understand and transform the structures and function of materials at the atomic and molecular levels. Chemistry thus must play a key role in finding solutions for many global issues, including energy, environmental, and resource related issues, that humanity is now facing. I hope that IChO2021 Japan contributes to foster many young talents who will be involved in the states of art of such aspects of chemistry.

Osaka, the venue for IChO2021 is surrounded by two old capitals, Nara and Kyoto, as the birthplace of Japan's politics and culture. Osaka is not just a lively, modern commercial city, but also is the birthplace of chemical research in Japan. I really hope that IChO2021 Osaka, Japan serves as a catalyzer for all participants to make many friends through personal communications and cultural exchanges.

However, the situation surrounding us has changed significantly last year, 2020. We have been experiencing a difficult situation due to the COVID-19 global pandemic. The IChO2020 Turkey was forced to be held online. I would like to express my heartfelt appreciation and congratulations to all members of the IChO2020 Turkey Organizing Committee and the Steering Committee for their great efforts to make the IChO2020 so successful with the Online Theory Exam on July 25 and the Online Closing Ceremony on July 30.

I am convinced that the great success of Online IChO2020, as the first attempt in IChO history, should be worthy of note in the following three points: (1) It provided precious opportunity to many talented high school students around the world to enjoy chemistry in their own countries. (2) They were given hope and courage to overcome unprecedented difficulties. (3) International friendships and trust have been strengthened among over 60 participating countries. We have learned a lot from the Online IChO2020.

At the end of the Closing Ceremony, I was invited to hand over the IChO flag through the computer from Professor Hasan Mandal, Chairman of the Organizing Committee for IChO2020 Turkey.

It is finally our turn, but the situation is still uncertain. We have started preparations assuming an Online IChO2021, as well as a real event in Osaka, Japan. In any case, we, organizing committee all together, will concentrate our efforts to lead a successful IChO2021 Japan.

Our final decision will be announced in due course. We ask for the understanding and cooperation of all those involved.



Dr. Kohei Tamao

President, IChO2021 Japan Committee
Chairman, Organizing Committee for the 53rd IChO2021 Osaka,
Japan

Japan

Area: 377,975 km² (61st in the world)

Population: 126.86 million (11th in the world in 2019)

Currency: JPY (103 JPY = 1 USD, 05/01/2021)

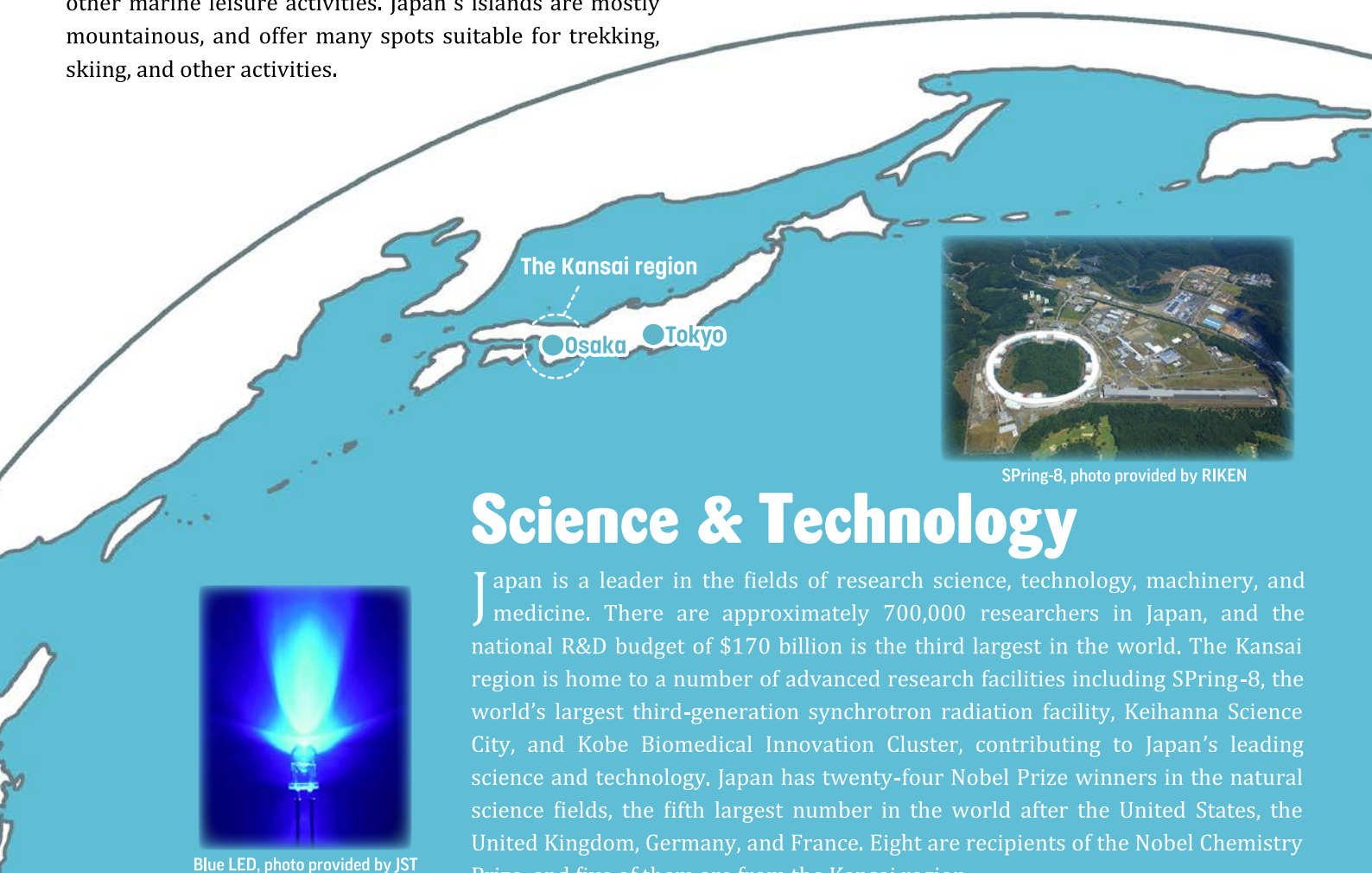
Language: Japanese (with many dialects)



The 53rd International Chemistry Olympiad (ICHO53) 2021 will be held in Osaka, Japan. This is the second time for Japan to host it; the first time (ICHO42) was in 2010 in Tokyo. Japan has approximately 6,800 islands, including the four major islands of Hokkaido, Honshu, Shikoku, and Kyushu, and is situated on the Eastern edge of the Eurasia continent. There are mega cities such as Tokyo and Osaka. However as soon as one steps out of such ultra-urban areas, one is greeted by beautiful mountains and streams. Japan is a country whose land stretches from north to south with various climates ranging from subarctic to subtropical, four seasons, and distinctive local regions rich in nature. As the Japanese archipelago is part of circum-Pacific volcanic zone, Japan has several active volcanoes and a countless number of hot springs all around the country. These springs result from volcanic activities and provide a rich resource for bathing. Additionally, Japan has a total of 300,000 kilometers of coastline, and consists of many islands where people can enjoy swimming, fishing, boating, and other marine leisure activities. Japan's islands are mostly mountainous, and offer many spots suitable for trekking, skiing, and other activities.

Along the Pacific coast, major industrial zones were constructed from which various chemical, mechanical, electronic, and automotive products are exported globally. Osaka prefecture, where the 53rd International Chemistry Olympiad (ICHO53) will be held, belongs to the Kansai region and is located about 400 kilometers from Tokyo, Japan's capital. It can be reached in only two and a half hours by the Shinkansen bullet train.

Japan's traditional culture has become increasingly popular among international travelers to Japan. This includes not only traditional crafts, *kimono*, and architecture, as seen in its historical shrines and temples. Japanese cuisine and its unique gastronomic culture are also attracting much interest, particularly among those who are health conscious. Japanese animation has become a focus of popular culture and is enjoyed by wide range of generations globally.



Science & Technology

Japan is a leader in the fields of research science, technology, machinery, and medicine. There are approximately 700,000 researchers in Japan, and the national R&D budget of \$170 billion is the third largest in the world. The Kansai region is home to a number of advanced research facilities including SPring-8, the world's largest third-generation synchrotron radiation facility, Keihanna Science City, and Kobe Biomedical Innovation Cluster, contributing to Japan's leading science and technology. Japan has twenty-four Nobel Prize winners in the natural science fields, the fifth largest number in the world after the United States, the United Kingdom, Germany, and France. Eight are recipients of the Nobel Chemistry Prize, and five of them are from the Kansai region.

Blue LED, photo provided by JST

SPring-8, photo provided by RIKEN

Osaka and the Kansai region

The Kansai region refers to the area in the mid-western part of the island of Honshu, which is the largest of the four main Japanese islands. This region consists of six prefectures, namely, Osaka, Kyoto, Hyogo, Shiga, Nara, and Wakayama. It is one of the largest economic zones in Japan, second only to the Tokyo area, and has three large cities, Osaka, Kyoto, and Kobe, whose populations exceed one million. Kindai University, the venue of IChO53, is located in Osaka Prefecture, which is a metropolis with a population of 8,800,000.

Historically, this area was once the political, economic, and cultural center of the nation. In the 7th century Japan's first capital and imperial castle were situated in present-day Nara (Asuka Itabukinomiya). The capital was transferred to Osaka (Naniwanomiya) followed by Nara (Heijokyo). It was then relocated to Kyoto (Heiankyo) where it remained for approximately 1,200 years before finally being officially moved to Tokyo in 1868. Given the long history of this area, there are many historical buildings that have been designated as UNESCO World Heritage Sites. Kyoto and Nara are especially well known as Japan's ancient capitals, making them highly popular destinations for domestic and international travelers.



Food

Japanese cuisine is well known worldwide. Among the most popular dishes are sushi, ramen, tempura, and curry and rice. In the Kansai region, Kyoto, which is surrounded by mountains, did not have good access to fresh seafood. Nonetheless, Kyoto is renowned for its cuisine made with unique local vegetables known as *Kyoyasai* and dried foods. Osaka, which is a center for fresh foods, has a rich and varied gastronomic culture that has flourished for centuries. Today it is known for *konamon*, a general term used for savory foods made from flour as well as fresh ingredients. Dishes such as *takoyaki* and *okonomiyaki* have become very popular, even among international visitors, as casual and inexpensive dishes with a savory taste.

The climate of this area may be divided into the Sea of Japan climate zone, the Pacific climate zone, and the Setouchi climate zone, which is sandwiched between the two. Given these different climate zones, the area is blessed with exquisite natural scenery. The Kii Mountain area that straddles the three prefectures of Wakayama, Nara, and Mie, is famous for its beautiful nature. The sacred sites and pilgrimage routes of the Kii Mountains are registered as World Heritage Sites.



Language

Standard Japanese language is used nationwide, but there are also various dialects particular to each region. It is often possible to tell which region a person is from by his or her intonation. Some dialects are distinctive which can make it difficult for someone who is not from that area to understand. The Tokyo dialect is now considered standard Japanese. However, in the Kansai region, there are many distinctive dialects spoken in different areas within the region, forming a group of Kansai dialects or *Kansai-ben*. There are slight differences among the dialects in the region making it possible to distinguish the part of the region from which the speaker comes. Further details regarding the Kansai dialect will be mentioned in Catalyzer No. 1.

The Venue Kindai University At a Glance

3-4-1 Kowakae, Higashiosaka City,
Osaka 577-8502, Japan

<https://www.kindai.ac.jp/english/>

Kindai University was founded in 1925. Now one of Japan's largest universities, it has six campuses in western Japan and boasts research facilities across the nation - from Hokkaido in the north to Kagoshima in the south. Currently, Kindai University comprises 14 faculties with 48 departments, 11 graduate schools, a law school, 18 research facilities, two junior colleges, 18 associated primary and secondary schools, and two teaching hospitals. The university has over 30,000 students and more than 500,000 alumni and has about 500 international students enrolled from all over the world. Kindai University has 250 partner universities in 50 countries and regions, and continues to interact with universities around the world. Kindai University conducts research in a wide range of fields and is making a name for itself as a leader in aquaculture, most notably for

its work with bluefin tuna. Dedicated to meeting the needs of today's rapidly changing society, Kindai University will continue expanding its educational programs and facilities.



Useful Japanese Phrases

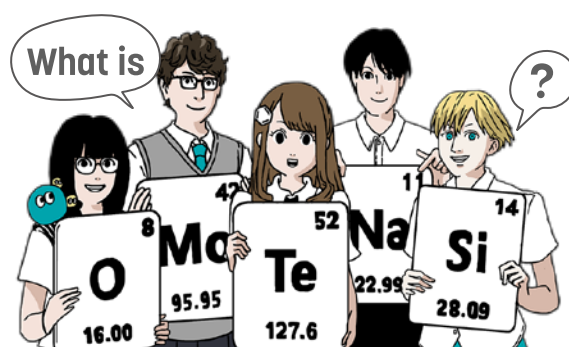
English

Good morning
Good afternoon
Good evening
Good night
Good-bye
Excuse me
I am sorry
I don't understand
Thank you
Yes
No
Please
Chemistry Olympiad

Ohayou gozaimasu
Kon'nichiwa
Kon'banwa
Oyasumi nasai
Sayounara
Sumimasen
Gomen nasai
Wakarimasen
Arigatou
Hai
Iie
Onegai shimasu
Kagaku orinpikku

Japanese

おはようございます
こんにちは
こんばんは
おやすみなさい
さようなら
すみません
ごめんなさい
わかりません
ありがとう
はい
いいえ
おねがいします
化学オリンピック



These five elements spell "OMoTeNaSi", the Japanese word for hospitality. It means to wholeheartedly take care of guests without expecting anything in return. Attention is paid to even the smallest details in order to bring guests the best experience possible. As you make your way across Japan, you will find *omotenasi* everywhere.

Chemistry! It's Cool!



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Official Website
<https://www.icho2021.org/>

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Weather information
(Average in late July)

Osaka



25 °C/35 °C
Humidity: 75%

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