



IMO 2023



Chiba, JAPAN 64th

IMO2023

Event Information

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1. Invitation to IMO2023 Events

The International Mathematical Olympiad aims to provide contestants with a comfortable environment so they can give their best throughout the event. Therefore, we hope that IMO2023 will be a memorable event where talented young people who participate from all over the world will have a good time.

To this end, we have planned various events in cooperation with the sponsors and organizations that have supported us in holding IMO2023. We hope that all participants will enjoy these events and deepen their interactions with each other.

2. Event Overview

The events will be held from July 7 to July 12 as follows.

Venues: APA Hotels & Resorts Tokyo Bay Makuhari for the following events:

- (a) Jane Street Hub at Cote d'Azur + Cotswolds (1st Floor)
- (b) Sponsors Booths in Shogetsu room (1st Floor) and on Sky Banquet (46th Floor)
- (c) IMO STEAM Culture Festival at Kobai room (1st Floor)

3. Information Desk

We will set up the information desk to assist the participants at the lobby (1st Floor) of the APA Hotels & Resorts, Tokyo Bay Makuhari, during the IMO2023. Please feel free to drop by if you have any questions or need advice.

4. Sports Event

We cooperate with the Kanda University of International Studies to organize the sports events as follows:

Date:

- (1) Sunday, July 9, 14:30-16:30
- (2) Tuesday, July 11, 13:30-16:30 (* Only Tennis available)
- (3) Wednesday, July 12, 9:00-12:00

Venue: Kanda University of International Studies

Activity and Capacity

- (1) Football (capacity: 30 people)
- (2) Tennis (capacity: 20 people)

Application for participation:

If you would like to participate, please apply through your team guide.

- (1) For Sunday, July 9, 15:00-18:00, please register at the information desk by Sunday, July 9, 14:30.

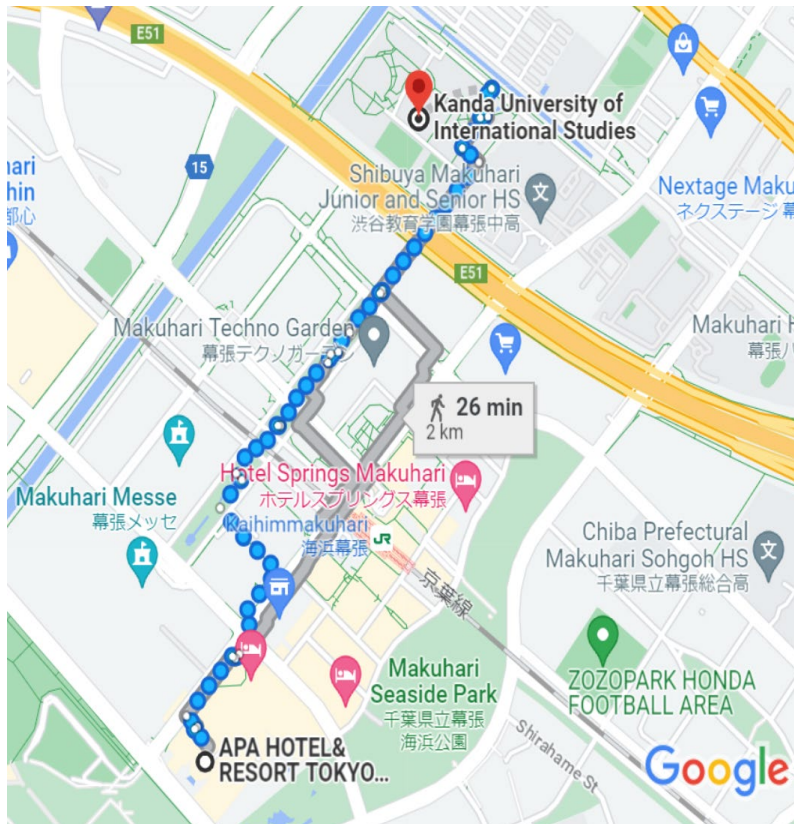
(2) For other cases, please register by the Google Form:

by Monday, July 10, 17:00:

<https://forms.gle/cBjM2h9XGNmDSWyK9>



Directions: The volunteer staff will lead you from in front of the APA Hotel.



5. Jane Street Hub

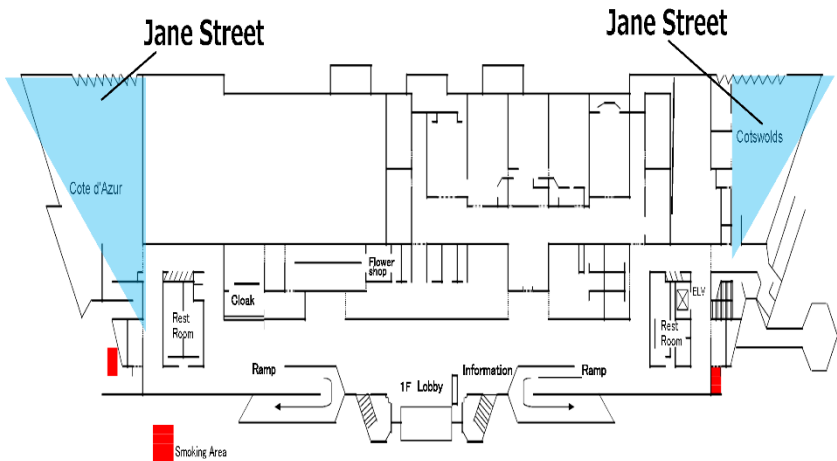
Jane Street Hub will be held as follows:

Date: Thursday, July 6, 15:00 – Wednesday, July 7, 9:00-12:00

(Open by 21:00)

Venue: Tokyo Bay Makuhari Hall 1F,
Cote d'Azur + Cotswolds

Tokyo Bay Makuhari Hall 1F





IMO 2023
Chiba, JAPAN



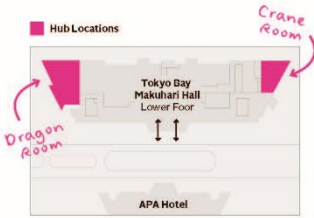
VISIT THE
JANE STREET HUB!

Located on the lower floor of the Tokyo Bay Makuhari Hall, the Jane Street Hub will be open from **July 6th – July 11th** between 9am – 9:30pm.

Stop by to play in the arcade, complete challenging puzzles, pick up some swag and relax with your fellow competitors.

Other things to look out for in the Hub:

Origami workshops with Tomoko Fuse
Renowned artist and author, Tomoko Fuse is often credited for pioneering the Modular Origami method.
Stop by her workshop on July 8th or 9th between 3-5pm to create unique origami art.



Figgie®
Ready to put your negotiation skills to the test? Stop by the Figgie tables in the Hub to learn a game designed and played by Jane Streeters.
Learn how to play: 

About us
Jane Street is a global trading firm with offices in New York, London, Hong Kong, Singapore and Amsterdam.



6. IMOF Sponsors Booths

The IMOF sponsors will organize their booth as follows:

Venue: APA Hotels & Resorts, Tokyo Bay Makuhari,
46th Floor Sky Banquet, Seine

Date:

- (1) Thursday, July 6, 15:00-21:00
- (2) Friday, July 7- Tuesday, July 11, 9:00-21:00
- (3) Wednesday, July 12, 9:00-12:00

6.1 Huawei IMOF Platinum Sponsors



Founded in 1987, Huawei is a leading **HUAWEI** global provider of information and communications technology (ICT) infrastructure and smart devices. We have 207,000 employees and operate in over 170 countries and regions, serving over three billion people worldwide.

Huawei's mission is to bring digital to every person, home, and organization for a fully connected, intelligent world. To this end, we will drive ubiquitous connectivity and promote equal access to networks to lay the foundation for the intelligent world; provide diversified computing power to deliver ubiquitous cloud and intelligence; build powerful digital platforms to help all industries

and organizations become more agile, efficient, and dynamic; redefine user experience with AI, offering consumers a more personalized and intelligent experience across all scenarios, including home, travel, office, entertainment, and fitness & health.

Huawei is committed to providing talent globally with platforms to help them improve their skills and ability. We endeavor to support problem solvers in their journey of exploring challenging subjects, driving progress in technology and science, and enhancing practical applications in industries. As the company's vision enlightens, we aim to connect the future with all of you.

www.huawei.com

6.2 QuantCo IMOF Silver Sponsors



We are excited to sponsor the IMO and to meet you throughout the week! Three of our colleagues are here representing QuantCo, and we encourage you to visit our booth to learn more about the world of data science and our work. We are a passionate and approachable team and are happy to answer any questions you may have!



My name is Suchan, and as a former participant & medallist in the IMO a decade ago (!), I'm happy to be back here representing QuantCo. It's hard to believe how quickly time passes, and I feel quite old now! I completed my bachelor's and master's degrees in computer science and mathematics at MIT and am passionate about combinatorics, probability, and statistics. At QuantCo, my work involves building machine learning models, optimizing solutions, and programming high-performance code.

I am Alejandro, and I completed my bachelor's and master's degree in electrical engineering at ETH Zurich (CH), where I focused on Machine Learning in the medical and automotive fields. At QuantCo, I team up with excellent engineers,



economists, and statisticians. Together, we help clients get the most out of their data: leveraging our Machine Learning and programming expertise to optimize data-based processes by developing robust and efficient solutions.



I am Carolin, and I have a background in quantitative economics (aka econometrics). I studied in Germany, Canada, Sweden, and the US, where I spent a year at Stanford researching causal inference and machine learning. I was intrigued by recruiting at QuantCo

and am now responsible for our global data science recruiting covering the US, UK, and Europe. I also travel to various competitions representing QuantCo, such as the IMO, EGMO, EGIO, CEOI, and others. If you would like to talk more about universities, programs or specific courses, I am happy to do so.

quantco.com

7. IMO2023 Sponsors Booths

The IMO2023 sponsors will organize their booth as follows

Venue: APA Hotels & Resorts, Tokyo Bay Makuhari,
46th Floor Sky Banquet, Seine & Riviera. and
Shogetsu

Date:

- (1) Sunday, July 9, 15:00-21:00
- (2) Monday, July 10- Tuesday, July 11, 9:00-21:00
- (3) Wednesday, July 12, 9:00-12:00

**7.1 Gibraltar
Insurance
IMO2023 Executive
Platinum Partner**



Gibraltar Life Insurance Co., Ltd. is a foreign-affiliated life insurance company headquartered in Japan. Prudential Financial Group, a major American financial capital, owns it. Gibraltar Life provides lifelong peace of mind to every customer throughout Japan through custom-made life insurance. We have supported the Math Olympiad Foundation since its inception. We are happy that the IMO2023 will be held in Japan this time. We hope many young mathematics enthusiasts will visit our booth and learn about our activities.

**7.2 Fujitsu
IMO2023 Executive
Platinum Partner**



Fujitsu is developing cutting-edge quantum computing technology.

In this demonstration, we will show a 64-qubit chip that is being developed jointly with RIKEN. Fujitsu has already started to use quantum computing technology, a dream technology, in

business. We will introduce Fujitsu's approach to quantum computing technology with use cases such as quantum simulators and digital annealers.

**7.3 Arithmer
IMO2023 Platinum
Sponsor**



Arithmer is an AI development company that supports the digital transformation (DX) of our customers and partners. Built on a strong foundation of mathematics, we are developing solutions that make full use of cutting-edge AI technologies for a plethora of different industries such as manufacturing, energy, construction, logistics, retail, biotech and more.

Original goods with the Arithmer logo will be distributed at the booth. We look forward to seeing you there.

**7.4 IBM
IMO2023 Silver Sponsor**



IBM Research has a long history of fundamental research in mathematical sciences, which has had lasting impacts on science, business, and society. We continue to make innovations

in mathematical sciences, with today's focus on advancing artificial intelligence and computing technologies.

7.5 Karakuri IMO2023 Silver Sponsor



Karakuri Inc. is a company with a vision of Friendly Technology, making cutting-edge technologies of the Web and AI easily accessible and approachable to many people. In our exhibition booth, we will be hosting an event where visitors can solve Math Olympiad problems using ChatGPT. Let's think about how to do math in the age of AI with Math Olympiad alumni. We will also have a traditional Japanese summer event called "Nagashi Somen" at the company visit event. And not just Nagashi Somen, but we will make computable Nagashi Somen. Enjoy the fusion of computer science and a traditional Japanese event!

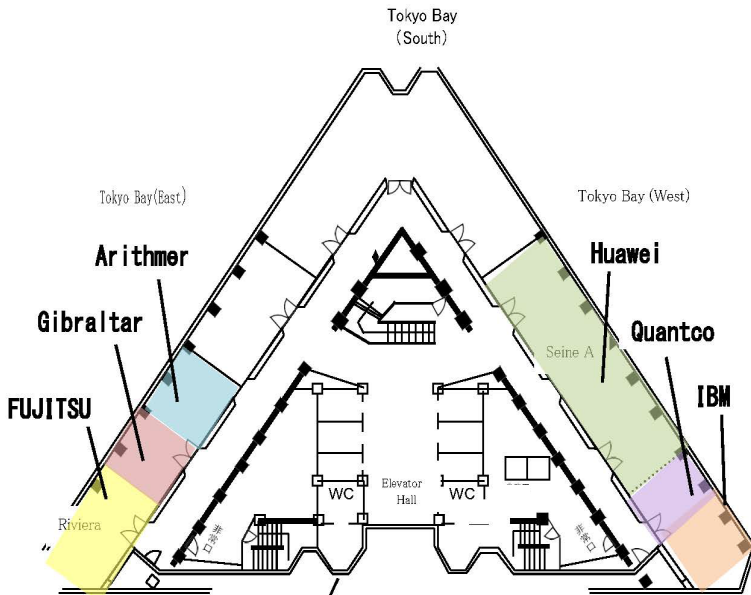
7.6 Yahoo IMO2023 Silver Sponsor



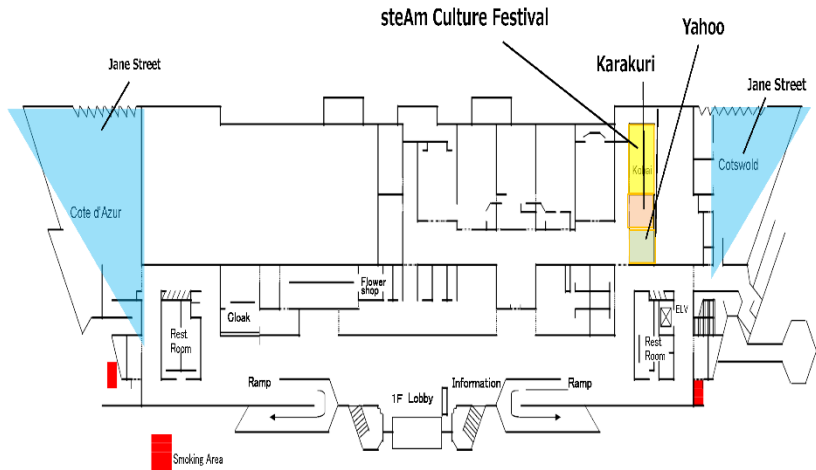
Yahoo! JAPAN provides approximately 100 services, including internet news and e-commerce. At the booth, we distribute goods with the Yahoo! JAPAN logo. Please feel free to drop by.

【Floor Plan】

46F SKY BANQUET



Tokyo Bay Makuhari Hall 1F



8. IMO steAm Culture Festival

The International Exchange projects will be organized by steAm as follows:

Date: Sunday, July 9, 15:00-21:00

Monday, July 10, 17:00-21:00

Tuesday, July 11, 15:00-21:00

Wednesday, July 12, 9:00-12:00

Venue: Tokyo Bay Makuhari Hall,

1st Floor, Room Kobai

steAm culture Festival (2023/7/8 - 12)

We welcome all the IMO2023 participants in July, in Japan! We wish you, not only enjoying mathematics but also Japanese culture, the cross-creative art x math works with Japanese cultural things.

Tea Ceremony with URASENKE lecturer! (July 9th)

Michael Hardy Sōgetsu (Urasenke Chadō Instructor)

Chadō, commonly referred to as “Tea Ceremony” in English, is actually a spiritual and aesthetic discipline for refinement of the self — known as a ‘way,’ or dō, in Japanese. Through the Way of Tea, students seek the principles of Harmony, Respect, Purity, and Tranquility. Within the preparation of matcha tea, there lies over four hundred years of knowledge, wisdom, history, and culture. Chadō is concerned with simple though meaningful everyday-life activities, yet to master Chadō requires great cultivation. The enduring allure of the Way of Tea since its perfection by Sen Rikyu in the 1500s is proof of the deep meaning that this “Art of Living” holds for all people.



Tsutsumi Junko’s FUROSHIKI (July 10th)

Junko Tsutsumi tells you the beauty of Furoshiki, how to fold, how to wrap up things, as well as introducing the mathematical patterns (tessellations).

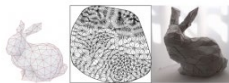


Tessellation Design Association: Tessellation Puzzles! & Math x Art Works (July 9th/11th)

How many triangles have you ever used, at most, to tile/tessellate on a two-dimensional plane? Let's play tessellating triangle pieces not to solve given problems but to pursue open-ended inquiries you just come up with in the play. In the booth, a bunch of triangular pieces called T3 Puzzle is available for you to create artwork, puzzles, and even abstract strategy games.



Math x Origami : some art works to be provided **(July 9th-11th)**



Tachi Tomohiro Prof. at University of Tokyo Jun Mitani Prof. at University of Tsukuba

Two great mathematicians (professors) treating ORIGAMI, would

show you various beautiful mysterious origami works based on mathematics.

Math x Music : some art works to be provided by various musicians!



All workshops here are planned basically by steAm members, together with great experts in



diverse areas. steAm BAND representative is Sachiko Nakajima, IMO gold medalist (1996), a jazz pianist, math researcher, STEAM educator, and thematic project producer at EXPO2025, Osaka, Kansai, JAPAN.

9. Alumni/Contestants' Meeting space

The IMO Foundation plans to have an opportunity to bring IMO Alumni and Contestants together as follows:

Date: Tuesday, July 11, 10:00–18:00

Wednesday, July 12, 9:00–15:00

Venue: Jane Street Hub

(Tokyo Bay Makuhari Hall)

Structure of event:

Tuesday, July 11 (2nd day of coordination):

Alumni arrive during the day, gathering in the Jane Street Hub, which is otherwise unoccupied because students are on excursion. IMO Foundation Vice President for Advancement (Po-Shen Loh) is the main contact for their program organization. At dinnertime, any country with alumni has its IMO Guide take the delegation to the Jane Street Hub to link up with its alumni. Then, the alumni treat the country's delegation to dinner at a nearby restaurant.

Wednesday, July 12 (closing ceremony day)

Alumni meet in Jane Street Hub in the morning and early afternoon, with program coordinated by Po-Shen Loh. Alumni will attend the closing ceremony.

10. Visiting Research Institutes and Companies

As one of the excursions on July 11, we plan to visit a research institute and several companies. Teams will discuss the schedule with their team guides about the schedule for the excursion on July 11. Teams interested in visiting research institutes or companies listed below should apply through their team guide.

< Research Institutes >

10.1 Tokyo University, Kashiwa Campus

(Super Computer Division, Information Technology Center, and Kavli Institute for Physics and Mathematics of the Universe)

(1) Information Technology Center

The Information Technology Center (ITC) of The University of Tokyo performs research on IT infrastructure such as networks, high-performance computing, data science, computer science, big data, security, and system software. It is also responsible for the design, implementation, stable operation, and user support of the university-and nation- wide infrastructures critical for research, education, and academia-industry collaboration. During your visit, we will show you "Wisteria/BDEC-01" supercomputer and "mdx" a cloud platform supporting data science, and give a short lecture on computational science using supercomputer

(2) Kavli Institute for the Physics and Mathematics of the Universe (Kavli IPMU)

Kavli IPMU is a world-class research center for the most pressing issues in basic science, such as dark energy, dark matter, and unified theories, with close collaboration between mathematics, physics, and astronomy. This program will include a tour of the

Kavli IPMU Institute on the Kashiwa Campus, the University of Tokyo, and a talk and discussion with mathematician and Kavli IPMU Professor Todor Milanov.

10.2 Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Japan Agency for Marine-Earth Science and Technology (JAMSTEC) is a national research and development agency under the jurisdiction of the Ministry of Education, Culture, Sports, Science and Technology. In addition to existing research vessels and submersibles, the research vessel transferred from the Ocean Research Institute of the University of Tokyo when it became an independent administrative agency in 2004 will be used to observe and research the ocean, continental shelf, deep sea, etc. Furthermore, mathematics, especially data analysis technology, is also used in ocean development research. Therefore, we would like to explain how mathematics is useful in ocean development research to the participants.

10.3 Mathematics Museum (Sugaku Taikenkan), Tokyo University of Science

The main purpose of the Mathematics Experience Center is to develop educational tools and teaching materials that enable

children and adults to enjoy learning mathematics, exhibit them, and disseminate the results domestically and internationally. At the same time, we aim to enhance first-year mathematics education at universities and to improve students' motivation to learn and educational abilities. So, please enjoy the fun of mathematics at the Mathematics Experience Hall.

< Companies >

10.4 Karakuri

Karakuri Inc. is a company with a vision of Friendly Technology, making cutting-edge technologies of the Web and AI easily accessible and approachable to many people. In our exhibition booth, we will be hosting an event where visitors can solve Math Olympiad problems using ChatGPT. Let's think about how to do math in the age of AI with Math Olympiad alumni. We will also have a traditional Japanese summer event called "Nagashi Somen" at the company visit event. And not just Nagashi Somen, but we will make computable Nagashi Somen. Enjoy the fusion of computer science and a traditional Japanese event!

10.5 Meiji Yasuda Life Insurance Company

Meiji Yasuda Life Insurance Company is the most historical life insurance company in Japan with 142 years of history. When you join our session, you can visit the Meiji Life Insurance Building, which is an important cultural property of Japan, and you can take a photo of the Imperial Palace from our head office.

In addition, we will introduce the job of the actuarial team which is mathematically specialized expert in insurance business. You can also get sightseeing information of Asakusa.

10.6 Mitsubishi Electric Corporation

We, the **Mitsubishi Electric Group**, will contribute to the realization of a vibrant and sustainable society through continuous technological innovation and ceaseless creativity; this is our purpose, and we've been working to solve social challenges through a wide range of businesses, from home appliances that are familiar to everyone to social infrastructure that supports our daily lives.

This summer, we propose you, the contestants of IMO2023, an **Exciting Sustainable Experience** at “**METoA Ginza**”. At Ginza, one of the most popular and fashionable town of



Japan, you can experience the latest technologies that help solve social challenges, and enjoy cold drinks...We're looking forward to seeing you then!!
<https://metoa.jp/en/>



10.7 NTT Institute for Fundamental Mathematics

NTT Institute for Fundamental Mathematics was established as a research center for mathematics with the objective of becoming one of the best research institutions of the world.

It is a remarkable fact that truly innovative mathematics that lead to completely new applications are often created out of the pure curiosity of mathematicians. This shows that unpredictable value is hidden precisely in explorations based on intellectual curiosity. Curiosity is an invisible, but great ability of mankind to make new discoveries and to develop new technologies. We, NTT Institute for Fundamental Mathematics, will lead the exploration of the frontiers of human knowledge as a world-class research center for mathematics that finds routes between different fields and uncovers unknown truths, with intellectual curiosity as our compass and sail.

At our institute, we are waiting for your visit with the following programs:

- (1) Tour of the NTT History Center of Technologies
- (2) Discussions with Professor Wakayama (Head of NTT-IFM, Fundamental Mathematics Research Principal)

11. Restranut Information/Shopping

This is an information on shops and restarurant around Kaihin Makuhari station. I hope you will enjoy there.

11.1 Shops

- **Aeon Mall Makuhari New City**

See the following webpage for details:

<https://en.aeonmall.global/mall/makuharishintoshin-aeonmall/>



- **Mitsui Outlet Park Makuhari**

See the following

<https://mitsui-shopping-park.com/mop/makuhari/english/>



- **Other shops**

There are many shops around the Kaihin Makuhari station.

11.2 Restaurants

This is a list of restaurants around Kaihin Makuhari station.

Name	type	website		Level
Restaurant (Kaihin Makuhari station)				
Tony Roman's	steak house	https://tonyromas.jp/		B
Italian Kitchin Vansan	italian	https://vansan-ltd.jp/vansan/vansan-makuhari/		B
Outback Steakhouse	Steak house	https://www.outbacksteakhouse.co.jp/locations/		B
Grand South Oceans	French	http://www.netnp.co.jp/quartilyon/index.html		B
Tofuro Kaihin Makuhari	Jananese (sushi)	https://tofuro-kaihinmakuhari.owst.jp/		B
Granvia	Spain ball	https://granviamakuhari.gorp.jp/		B
Uodokoro Chouchi Kaihin Makuhari	Japanese (seafood)	https://choichi-kaihinmakuhari.owst.jp/		B
Taishoken	Chinese	https://www.hotpepper.jp/strJ001274945/		B
Y's Biking restaurant	Buffet	https://nilax.jp/brand/dhall1/store/411.html		B
Chakun restaurant	Chinese	https://chakun.owst.jp/		B
Aburi no Sachi	Japanese(seafood)	https://all-e.info/aburimakuhari.html		B
Toritestu	Teriyaki bar	http://www.tori-tetsu.com/shop/1478p/		B
WBG Club Rounge +	buffet	https://www.wbg35.com/shop_restaurant/wbg-clublounge		B
Kamakura pasta Brena Makuhari	pasta restaurant	https://www.saint-marc-hd.com/kamakura/shop/419/		B
Kaikai	Japanese	https://ggyy800.gorp.jp/		B
Tinun	Thai	https://spiceroad.co.jp/Shop_FC_Kaihinmakuhari.html	stall	C
Yamadenmaru	Japanese(seafood)	https://yamato-f.jp/store/#yamadenmaru-top		very friendly C
Craft Market Kaihin Makuhari	beer restaurant	https://www.hotpepper.jp/strJ001219042/		C
Asian Bistro	Asian Cuisine	https://r.gnavi.co.jp/gd05400/menu/2/		C
Nouka-no-yorokobi	Japanese(seafood)	https://noukanoyorokobi.owst.jp/		C
Nagomi-an	Japanese	https://nagomian.owst.jp/		C
Mantra	Indian restaurant	http://www.mantra.jp/ja/menu/menu_course.html		B

Hotel New Otani				
Senbazuru	Japanese	https://www.newotani.co.jp/makuhari/restaurant/senbazuru/		S
Sazanka	Japanese	https://www.newotani.co.jp/makuhari/restaurant/sazanka/		S
Isshin	Japanese	https://www.newotani.co.jp/makuhari/restaurant/isshin/		S
Taikan-en	Chinese	https://www.newotani.co.jp/makuhari/restaurant/taikanen/		S
Keyaki	Teppan Grill	https://www.newotani.co.jp/makuhari/restaurant/keyaki/		S
Sky Salon Keyaki	Teppan Grill	https://www.newotani.co.jp/makuhari/restaurant/skysalon/		S
Shell-the-Garden	Hawaiian barbecue	https://www.newotani.co.jp/makuhari/restaurant/shell-the-garden/		S
Hotel Manhattan				
The Terrace		https://www.the-manhattan.co.jp/restaurant/terrace/		A-S
Splendid	bar and lounge	https://www.the-manhattan.co.jp/restaurant/splendid/		A-S
Origine	Japanese	https://www.the-manhattan.co.jp/restaurant/origine/		A-S
Hotel Springs				
Violet	bar	https://springs.co.jp/restaurant/violet/		A
Carmel	buffet	https://springs.co.jp/restaurant/carmel/		A
Suiran	Chinese	https://springs.co.jp/restaurant/suiran/		A
Genkai	Japanese	https://springs.co.jp/restaurant/genkai/		A
Hotel Green tower				
La Fore	buffet	https://www.greentower.co.jp/restaurant/laforet_buffet/		B
和食 中華 桂翠 Keisui	Japanese, Chinese	https://www.greentower.co.jp/restaurant/keisui/		A
Hotel Francs				
Hotel Francs restaurant		https://www.francs.co.jp/restaurant/restaurant/		S
APA hotel				
Dining Bar		https://www.apahotel.com/hotel/shutoken/chiba/makuhari/restaurant_06/		A
Farmers Kitchin Green time		https://www.apahotel.com/hotel/shutoken/chiba/makuhari/restaurant_08/		B
Retraunt Lavenda		https://www.apahotel.com/hotel/shutoken/chiba/makuhari/restaurant_05/		B
Pizza and Pasta		https://www.apahotel.com/hotel/shutoken/chiba/makuhari/restaurant_03/		C
Cost: per person / S: more than 10,000JPY / A: 8,000-10,000 JPY / B: 5000 JPY / C: less 5,000 JPY				

MAP around the contest venue



12. Sponsors List

The following sponsors made generous donations to



13. Emergency Calls

If you have any emergency such as sudden illness or theft, please contact your team guide first. If you cannot reach your team guide, please call the following

1. **Police:** 110
2. **Ambulance:** 119

Both numbers are available 24 hours per day in English.