

物理

BUTSURI

ISSUE 8

Sunday, July 16th

| Full-day Kanto
| Excursion

| Scenes in Japan

| Invention of Permanent
| Magnet

| Making of Mount Fuji

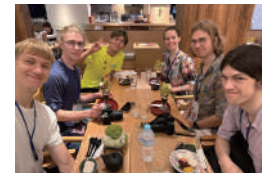
Excursion -Kamakura-



Turkey: UNVER Arda



In Kamakura, I found it really interesting to see Japanese culture, which is so diverse and beautiful. Temples and shrines beautifully get along with nature and scenery. Visiting Kamakura was a wonderful experience for me. If I had a chance, I would like to come again.

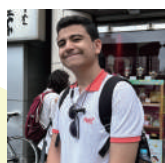


Australia: CHAN Kelvin



Kamakura was really nice. First I visited a temple, which was really relaxing. The architecture was really beautiful as well. Then we went to eat Japanese traditional food, soba, and so on. All of them are really nice and delicious. I think I learned about Japanese culture and I really enjoy this experience.

Iran: FAYZ Shayan



It was a good day. We had a lot of choices in Kamakura. We went to a temple and took a lot of pictures. I think temples and shrines show Japan's cultures really well and it was a nice experience to learn about them. We ate sea food, like sashimi and fried fish. Fried fish was really nice.



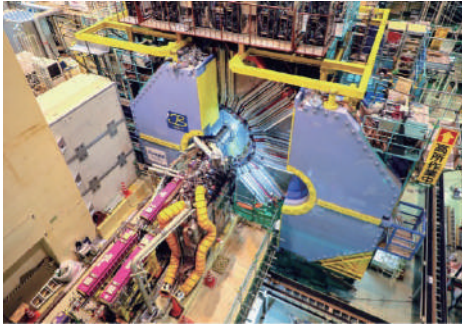
Excursion -Tsukuba-

Oly team of Individuals
ERSHOV Aleksandr

I really enjoyed the tour of KEK. At first, the staff just showed us some strange instruments with big mass. I thought it will be soon over so they showed them to us.

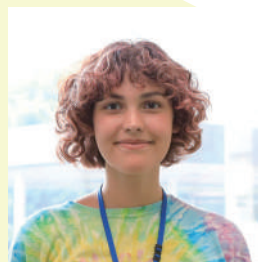
I was amazed to find out the largeness of KEK with its magnificent infrastructure. The memory of this visit will last forever.

KEK はカッコいいです！



Iceland
GUNNARSDOTTIR Ashali Asrun

At KEK it was totally cool listening and seeing how everything works. Especially, the particle accelerator was really amazing. I like it because it looks very cool.



Malaysia
MOHAMMAD Syakir FahmieE

Tsukuba City was very beautiful and reminded me of my hometown because both are full of greenery. That's why I was excited to see the green city environment.



Excursion

-Nikko-



Netherlands: WASSENAAR Steven
Nikko Toshogu was very interesting. It shows the culture of Japan very well, i.e., very old culture. I don't know how old it is, but it is still very beautiful. Old buildings here inspired us.



Pakistan: KHAN Aalia
NIKKO IS BEAUTIFUL! It is a very beautiful place. I love the greenery here because the greenery and freshness are like coolness to my eyes. I'm very happy that we actually came to Nikko. Nikko Toshogu, a Shinto shrine with historical architecture, was beautiful. I like this architecture very much. In Pakistan, we don't have many buildings like this, and I have never been to something like this. We saw the sculpture of a sleeping cat. All these things make us realize how versatile the cultures in the world are. This versatility amazed me the most during this IPhO competition.



El Salvador: DORADEA MELÉNDEZ Miguel
Isaias

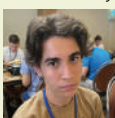
Nikko Toshogu was really nice. I liked the weather, even though it was raining then. Amazingly, this historical architectural building was old but preserved very well so I like that. I took several photos of the sculptures of the three wise monkeys indicating "see no evil, hear no evil, and speak no evil." They are really cool.



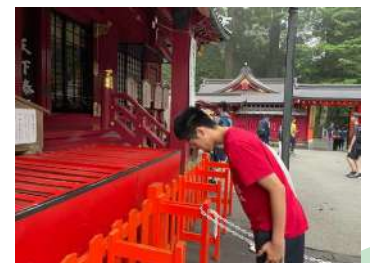
- Hakone-



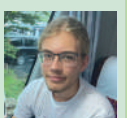
Montenegro: CUROVIC Vuk
We had pretty nice views of the Japanese countryside. It was certainly a scenic trip to Hakone. Unfortunately, it was kind of disappointing because of the fog; we could not ride the boat or the ropeway. But I'm just trying to see the positive side of everything. Probably it could have been a nice trip if it were not for this weather. Also, we saw Mt. Fuji from the bus while we were under the road edge. It was really big and monumental. You really kept seeing it and understanding the size of it.



Lithuania: RAZBADAUSKAS Tomas,
KALINAUSKAS Paulius, VIRSILAS Jokubas &
BABELIS Tomas
This excursion to Hakone was lovely. We traveled four hours to Hakone but unfortunately, we couldn't see Mt. Fuji clearly. We hope to climb Mt. Fuji someday. But the food we ate was really cool, memorable, and unique. It was definitely real Japanese food and better than what we eat at the cafeteria "Fuji". In particular, we loved the dessert. At Owakudani, we got off the bus to walk. The wind tried to blow off our flag for a second, but we retrieved it. It was so much fun.



Luxembourg: FOYSTER Barnaby Sharp
The trip to Hakone was really good. It was too bad that a part of the trip was canceled due to bad weather. The meal was really good and great. It definitely had lots of stuff that I recognized from my experience at other places in Japan. Fortunately, I was able to see Mt. Fuji from the bus window and I took its pictures. It looked really impressive and beautiful. It is definitely one of the largest mountains I have ever seen. This whole area was really beautiful and I like it very much.



Scenes in Japan

Cherry Blossom Viewing

Every spring, cherry blossom viewing is held throughout Japan. When the cherry blossoms are in full bloom, people gather with friends and family for a picnic in a park or along a riverside to view the beautiful blossoms.



Summer Festivals

In summer, festivals are held in many places. Festivals include processions of floats and portable shrines, many stalls with food stands, and fireworks displays at night. Bon dances are also held in a lot of places and people dance around a high wooden stage, as most of contestants may have experienced on the evening of July 12th.



Autumn Leaf Viewing

Autumn leaf viewing is held throughout Japan in the fall. This is called "Momijigari", which means to enjoy strolling through the beautiful scenery of autumn leaves.



New Year's Day

New Year's Day is one of the most important events in Japan. Family members get together and eat traditional foods such as "osechi ryori" and "ozoni", and go on "hatsumode" (New Year's visit to shrines).



High School Baseball Tournament at Koshien (甲子園)

Baseball is a popular sport in Japan. In spring and summer, the National High School Baseball Championship games are held at Koshien Stadium in Nishinomiya City, Hyogo Prefecture. The representative teams that have won the qualifying games in each region of the country participate in the tournament. "Koshien" (甲子園) means the pinnacle of high school baseball in Japan and attracts nationwide attention. Just like the International Physics Olympics, the games at Koshien are a once-in-a-lifetime experience for the players and generate a lot of emotion and drama.

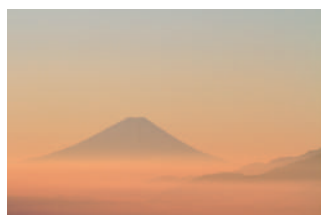
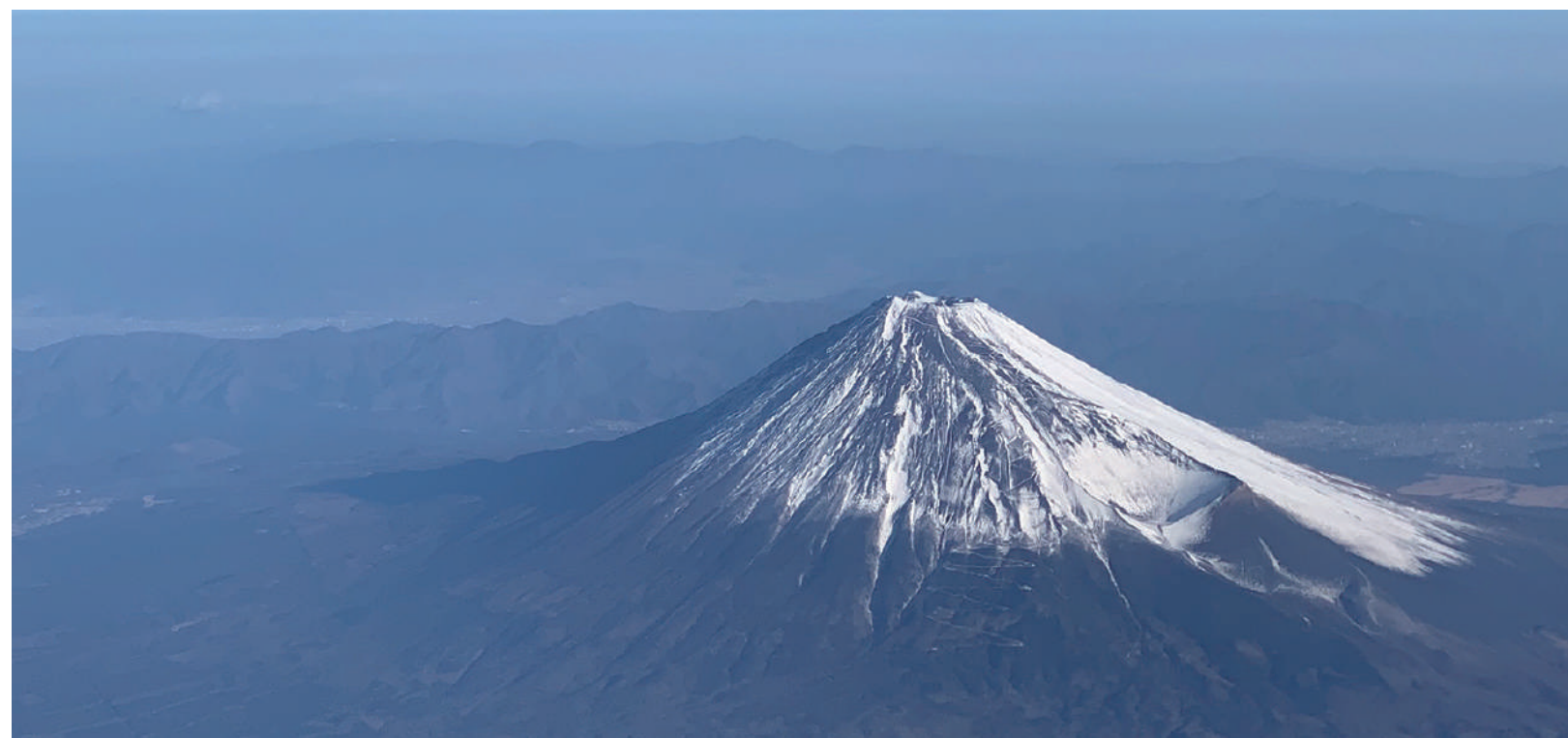
The invention of the sintered permanent magnet Nd-Fe-B

Have you ever held a neodymium magnet in your hand? A neodymium magnet is a permanent magnet made of Nd-Fe-B and is one of the magnetic materials indispensable to modern industry. Although such a neodymium magnet is one of the most important magnetic materials, it is not well known that a Japanese scientist and inventor, Masato Sagawa, is actually the developer of this magnet (note that John J. Croat was an independent developer at the same time). In this article, we trace the history of Sagawa's development of neodymium magnets.

Sagawa had done basic research on the structure of solid surfaces before he joined Fujitsu Laboratories. However, when he joined the company, he was given a research project by his supervisor to improve the mechanical strength of Sm-Co magnets, which were the strongest permanent magnets at that time. In the course of his self-taught research on the $\text{Sm}_2\text{Co}_{17}$ magnet, Sagawa began to wonder what caused the difference in magnetism between Fe and Co. Then, in a presentation by Masaaki Hamano from Institute for Materials Research, Tohoku University on January 31, 1978, he heard a report that the small Fe-Fe interatomic distance in R_2Fe_{17} (R: rare earth) crystals destabilizes the ferromagnetic state of the crystal. Sagawa then thought that he could expand the Fe-Fe interatomic distance by alloying carbon and boron, and he took up the challenge of searching for magnet materials based on R-Fe-X (X=C, B) compounds, an unknown and clear research subject. In 1981, Sagawa resigned from Fujitsu and joined Sumitomo Special Metals to devote himself to the development of magnets. Within several months after joining Sumitomo Special Metals in 1982, he developed the strongest sintered Nd-Fe-B magnet that could withstand practical use.

In both Kotaro Honda, who developed the KS magnet (see page 6 of ISSUE 4), and Masato Sagawa, who developed the neodymium magnet, we can see a spirit of persistence based on thorough experimentalism and the practice of Deeptech, which links the academic and industrial worlds.

Making of Mount Fuji



Mount Fuji

- Height: 3776 m
- Location: on the border of Shizuoka and Yamanashi Prefectures
- Active volcano, last eruption in 1707
- World Heritage Site

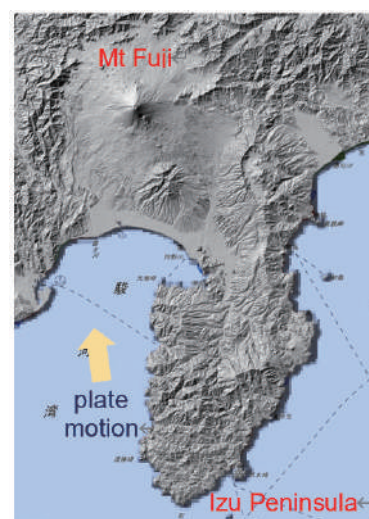
You probably heard about how the Himalayas, the highest mountainous terrain on earth, were formed through geological forces. About 300 million years ago, landmass on the Earth formed a single supercontinent called Pangea. The piece which later became the Indian subcontinent was located in the southern hemisphere next to the African piece.

About 200 million years ago, the Pangea began to break apart. The Indian subcontinent drifted northward heading to the Eurasian continent. The Indian Plate submerged underneath the Eurasian Plate. This caused a gigantic lift of the landmass, resulting in the formation of the Himalayan range and the Tibetan plateau.

A similar geological event, albeit smaller in scale, was responsible for the formation of the landscape around Mt. Fuji. The landmass now constituting the Izu Peninsula used to be an island located far south in the Pacific Ocean. It was driven northward by the tectonic motion of the Philippine Sea Plate, and crashed onto mainland Japan, causing an uplift of the area creating an intriguing geological structure.

Along the direction of this plate motion, a train of volcanos called the Izu-Fuji Volcanic Zone is formed. The most recent large-scale eruption of Mt. Fuji (the Hoei eruption) occurred in 1707, which resulted in massive ash falls all over the Kanto Plain causing disastrous crop failure and subsequent tragic famine. Mt. Fuji has been dormant for the last 300 years, but may well become active again any time in the future.

Mount Fuji, offering us beautiful scenery (and disaster risk), is an artwork of subtle tectonic and volcanic action of the Earth.



SCHEDULE

TODAY
Sunday, July 16th



27°C
36°C

Students

7:15-8:00 Breakfast NYC
8:00-19:00 Full-day Kanto
Excursion

Leaders & Observers

7:00-8:00 Breakfast NSH
9:00-12:15 Moderation NSH
12:15-13:30 Lunch NSH
13:30-16:45 Moderation NSH
18:00-19:30 Dinner NSH
20:00-23:00 Final Board Meeting NSH

TOMORROW
Monday, July 17th



27°C
37°C

Students

7:15-8:00 Breakfast NYC
9:30-12:00 Closing Ceremony NYC
12:20-13:30 Farewell Lunch NYC
Departures

Leaders & Observers

7:00-8:00 Breakfast NSH
9:30-12:00 Closing Ceremony NYC
12:20-13:30 Farewell Lunch NYC
Departures

NYC: National Olympics Memorial Youth Center
NSH: Nippon Seinenkan Hotel



The Physical Society of Japan



Japan Society of Applied
Physics



The Physics Education
Society of Japan



The Biophysical Society of
Japan



Japan Science and
Technology Agency (JST)



National Institution for Youth
Education (NIYE)



National Museum of Nature
and Science



Japan Arts Council



Tokyo National Museum



The University of Tokyo



Tokyo University of Science



Tokyo City University



Tokyo University of Foreign
Studies



International Christian
University



Sophia University



INTERNATIONAL PHYSICS OLYMPIAD
2023 TOKYO JAPAN



<https://ipho2023.jp/en/>



ipho_2023



ipho2023

“物理 BUTSURI” daily magazine
Editorial Committee Member:

TOHYAMA Takami, IYE Yasuhiro, OOKA Aki,
SHINODA Erika, ANDO Karin, JOKA Natsumi,
KIMPARA Michiru, SASAKI Yasutaka,
ONO Yoshimasa (translator),
OONO Aiko (photographer),
SHIMIZU Takeshi (photographer)