



FGL Community

NEWSLETTER

SPRING 2023

The cold winter has passed and the blooming season of Japan has come. With that, it is also the beginning of the new semester. Are you ready?

For those of you in your second and third year of undergraduate studies, this year marks a significant milestone in overcoming the various difficulties brought on by the COVID-19 pandemic. Finally, we can get back to a normal campus life again.

For the first-year students, this will be the first spring you'll experience outside of your hometown, and it will also mark the beginning of an exciting university life. What are your expectations for university life in Japan? What are you looking forward to achieving?

The year ahead will be a brilliant one, so seize the moment!

The undergraduate period is also known as the freest time in one's life, so don't let your youth slip away unconsciously. Enjoy your lives as much as possible within the limited time. As one of the authors of the FGL Community, I hope that our articles can be helpful to you and, I sincerely hope that you can enjoy this beautiful season to the fullest.

Contents

02 ASK SENPAI

06 Picnic Spots during Spring

08 ASK SENSEI

12 Transportation Guide

15 4th year Student's Research Article

17 Internationalization, and Formation of FGL



Sakura tree by the Sakura Hall in Katahira Campus

ASK SENPAI

Syamil Muharror (Sam), 4th year, AMC

Question writer: Alisa

Interviewer: TK



Let us engage in a series of questions and answer between Sam and TK!

Of course, let's start with the basics:

What is your name, grade, and department?

Syamil Muharror (Sam), 4th year, AMC

Where is your home country?

Indonesia, (spiritually US).

Let's learn more about you!

Why did you choose Tohoku University, or more broadly, Japan?

I have always wanted to live abroad, so I decided to go look for universities outside of the country. Amongst the universities that I applied to during final years of high school, Tohoku University was the one that offered me a full ride scholarship, so I chose to go here.

**Were you comfortable with Japan before moving? If yes, why did you know it before?
If not, how comfortable are you now, and how did you study?**

For some reason, I had always thought Japanese people speak really good English. I couldn't be more wrong about that. Coming right before COVID was a really weird experience for everyone in my batch, I think I can speak for everyone that our university experience was cut short.

Now I am more comfortable with life in Japan as there is no more language barrier for me. For study, it changed quite significantly during COVID as it was all online, I would say it's getting better now. But I developed some weird study habits that I tend to work better from home compared to going to the university, especially when working with computers.

How is school life? Are classes hard yet interesting, and has your experience with the teachers been positive?

Well, as a fourth year student I don't have classes anymore, I just spend the weekdays going to the lab working on my graduation thesis or working. Professors in AMC are super chill in my opinion, and I get along with them pretty well.

What is your everyday experience? What time do you usually get up and sleep? Does it change based on the day to accommodate early or later classes?

I think I have a healthier sleeping schedule than most IMAC-U students. I sleep late at around 12-1 and then I wake up at around 8-9 AM regardless of class schedules. I hate 8:50 AM classes though, so I avoid them like the plague. If I can take the morning class online, it's not a problem.

What are some of your hobbies and interests? Can you still pursue them with a busy class schedule?

I think I have the most generic hobby, I just read books, manga, and watch YouTube. If I had more time, I would just hangout and drink with my mates. I do enjoy making my own latté recently as I just bought a new espresso machine.

Can you spend time with your friends? Do you miss your family and homeland?

I would say so, I think I have enough spare time to spend with my friends. I don't usually call my friends back at home though because they are mostly playing Valorant and I can't play that since I'm a Macbook user. I do miss my family though since I haven't returned for three years. I call them every week though.

What industries and sectors are you currently interested in? Any personal endeavors or fixations that you would like to share?

Honestly, I think I am a generalist. I have many random skill sets that can be applied to many different things. For now, I am thinking of becoming an academic, perhaps in the US, maybe in Japan. I have worked in a lot of random jobs during my 3.5 years stay here. I call them "side quests". I honestly think all of them are kind of boring, and working in the lab interests me the most. So that's my reason for becoming an academic. If that does not work, I am thinking of becoming a consultant as I like working and talking with people.

A lot of first years must have worries when it comes to entering college, much less one in a foreign country. For example, kids from some countries may not have a senpai they are close to and are often left to navigate this system by themselves. Here are some questions that some new students may want to hear answered by a senpai.

Can you discuss any personal or professional goals that you have for the future?

My personal goal is to live with my girlfriend in the future, finishing off our long distance relationship. I am pretty satisfied with that as my goal honestly. For professional goals, I think just starting my career first should be a clear good-enough goal for me. It does not necessarily have to be related to chemistry or my long-term career aspirations.

Do you believe that you can foster a sense of creativity and innovation in university?

It depends on the person. If you put yourself out there and take as many opportunities as you can, you may develop your sense of creativity and perhaps find what you really want to do in life. In contrast, if you just keep holing up in your room, you wouldn't be able to grow much as a person. Get outside, touch some grass and talk to people.

How do you choose to measure your success?

I know many students, especially ones that are so academically driven, tend to focus their self-worth on measurable values, such as grades and GPA. However, that tends to be narrowing and can lead to an unhealthy obsession.

Do you, as a senpai, feel like grades are indeed the best motivator, or have you chosen something else to evaluate yourself with?

Grades are important, but I feel like it is not the best measuring stick for you as a person. Of course, you need grades to get into good graduate schools, scholarships, etc. But if you cannot connect with other people, are unsociable, cannot work in teams, then it's kind of meaningless. I think there has to be a good balance between academic and social life especially in college where you are given the opportunity to fail and not get any harsh repercussions.

Who is the person/persons you rely on the most? Are there any teachers or staff that you found can help you tackle the stressors of university life or did you make a community of friends and senpai who go through similar experiences with you?

Always having someone who will support you regardless of anything is the best thing one can hope for. I am forever grateful to my partner for that. Other than her, Brian-sensei is the closest university professor that I can always count on and talk to. My advisor, Takahashi-san, is also super nice, so I can always talk about anything to him. I have groups of friends inside and outside of the university that I can rely on as well, so that is helpful. If you have trouble finding friends or groups of friends, I highly recommend that you should reflect on your behavior first, and then try to go out as often as you can (accept invites if people invite you).

That was a lot of hard questions. Here are more questions to let us know about YOU and your time here in Sendai. Don't be afraid to talk about what you find interesting - no need to give cookie-cutter answers!

Niche recommendation in Sendai? It can be sightseeing, food, or just entertainment. Tell us about the cheapest karaoke, tastiest sweets, or best sakura-viewing sights!

Darestore café has the best coffee in Sendai, no competition. There is a place in Miyagi with a small zoo (with capybaras!), onsen, and barbecue all in one. Hit me up on Instagram if you want to know @meraculin.

Do you listen to music when you study? What do you recommend?

I like listening to Kpop when studying, mostly because I don't understand Korean and the beeps and the boops are nice. If I am just chilling, I will listen to hiphop, mainly Tyler the Creator cause he's the GOAT.

Any other words?

This April, along with my small team, we started activity again for TUFSA
(look it up tufsa.net).

Look forward to our event! By the time of release of this newsletter, we will have a barbecue coming up! Check our Instagram (@tufsa_official).



Capybara!^^

Our Favorite Picnic Spots in Sendai

by Jojo and Max

At last, spring has arrived! This year, sakura blossoms bring new friends, warm weather, places to visit, and things to do, so you might want to dust off your picnic baskets and checkered blankets, because now is the perfect time to enjoy the outdoors, whether it's with friends, family, or someone special. To help you do some of the thinking, here are some spots we can safely recommend for this picnic season.

OMACHI NISHI-KOEN

Only 10 minutes walk from the Kawauchi subway station, this park has lots to offer, especially in the Sakura season. Whether you come in the morning, afternoon or at night, you are sure to find food stalls lining the lively park, making this the perfect place if you don't want to bring your own food and drinks.



HIROSE RIVERBANKS

Flowing through the center of Sendai City, the banks along the Hirose River are a well-known spot for people to have picnics and barbecue with their family and friends. This is especially so during the spring and autumn seasons, where the weather is especially nice and breezy. A particularly famous spot would be the riverbank near the Ushigoe Bridge in the Hachiman area. It takes around a 7 minute walk from the Kawauchi station. If you're looking for a spot where you can freely chat and eat while enjoying the river, then look no further!



~Word Search Puzzle~

The arrival of spring marks the emergence of new life all over the world. Play the puzzle below, and find all 11 words that describe the spring season!

Note that the words can go in any direction and may cross over each other.

F	M	F	P	Z	K	N	A	B	L	O	S	S	O	M
L	O	Y	S	S	S	A	R	G	T	B	E	G	R	S
O	T	T	C	U	U	T	U	T	U	U	I	P	L	O
W	Z	S	Y	H	U	A	K	X	P	M	L	X	G	M
E	F	B	X	O	E	X	A	Y	A	S	U	I	B	G
R	N	M	R	C	C	R	S	N	J	L	V	O	P	Z
S	C	P	C	Z	Y	H	R	A	I	Q	H	X	J	K
H	S	I	T	F	O	K	S	Y	N	X	P	A	W	D
M	E	G	N	E	T	N	O	T	P	K	G	F	Z	Q
H	L	X	L	C	F	O	D	K	O	A	E	Z	M	K
O	L	P	R	E	I	G	K	C	R	P	K	P	R	N
L	P	E	T	T	C	P	X	D	N	S	D	X	U	F
A	F	L	R	I	E	I	E	J	T	G	X	E	L	C
C	X	Q	H	G	E	N	P	B	H	J	O	H	L	N
R	C	L	I	S	T	R	A	W	B	E	R	R	Y	C

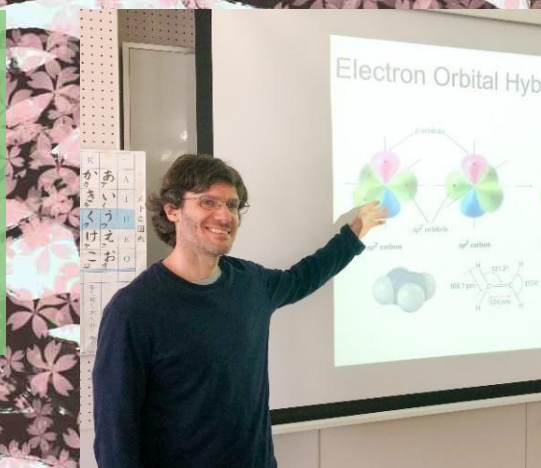
Hints:

Apple
Blossom
Cherry
Flowers
Garden
Grass
Picnic
Sakura
Sprout
Strawberry
Tulip

ASK SENSEI

Professor Derrick Mott

Interviewed and written by
Chanisa Prompattanapakdee



In this season's "ASK SENSEI", we decided to interview Professor Derrick Mott, one of the professors in charge of chemistry subjects for the FGL community. Let's learn about this amazing professor's life experiences and advices for the students!

Could you tell us your life story?

Wow! This could take a while. Let's see, I was born in upstate New York in the USA and graduated from a small local high school there. Even when young I was interested in science and chemistry and wanted to pursue a career in those fields. I would spend my time doing model rocketry, satellite tracking, film photography (digital cameras had not been developed yet), reading about new technology, and of course pursuing my high school chemistry courses. It is also important to note that I had the opportunity to travel internationally at a young age. I first traveled abroad when I was 13 years old with my aunt, who had been a French teacher and spent several years there for her own studies. She took me to various places across Europe including France and Switzerland, and this is still one of the most memorable and impactful experiences I have had today. I think the ability to experience a different country and culture was a big reason for me to want to expand my horizons, pursue a higher education degree and travel abroad for work and study.

Finally though, when it came time to graduate high school (1999), it seemed a natural fit for me to attend the Rochester Institute of Science and Technology (RIT), which I think perplexed my parents and teachers. RIT is a private college and is much more famous for its engineering programs than for chemistry, which is a smaller and more intimate department. It was for that reason though that I think I gravitated toward attending this school for my Bachelor of Science degree. My chemistry courses typically had less than 10 students per class, the professors were attentive and well versed in their respective fields, and Rochester was not too far from my hometown, so I could travel back on the occasional weekend. In addition, RIT had a photography program that intrigued me, and I was able to take some photo classes as electives, it was a great chance to develop my old hobby as well. My time in Rochester was challenging but very valuable and I developed a real passion for analytical chemistry and instrumental analysis. I also decided near the end of my studies to pursue a higher degree and go for my PhD.

As my Bachelor studies ended, I searched for a university to continue my education. Two contenders rose to the top, Syracuse University in central New York, and the State University of New York (SUNY) at Binghamton. Both were well recognized learning centers with great reputations, but SUNY Binghamton won out for me. They offer a great science program with a focus on analytical chemistry and had a department dedicated to

the emerging field of Materials Science at that time. My first couple of years in the PhD program there were a bit rocky as I struggled to complete the education requirements, juggle part time work as a Teaching Assistant, and searching for a research lab that I was comfortable with. In time though, all of these worked out and I joined Professor CJ Zhong's laboratory, focusing on nanotechnology and the development of nanoparticles for applications in catalysis, sensing and diagnostics. The lab was a great fit for me because I could focus on the development of new nanoparticle based materials, then characterize them using a host of advanced analytical techniques, one of the passions I developed from my earlier studies. My research work at that time came to be published in several scientific journals, and I traveled along the East Coast to scientific meetings to present my results, all memorable aspects of my graduate studies.

Eventually, my years in graduate school were coming to an end, and I had to consider my next career choice. It was a big decision to choose between industry or stay in academia, but I also wanted to travel abroad for work and I knew I wanted to live and work in Japan for a time. Without connections, it can be quite challenging to make a direct jump from the USA to Japan for a job in research or education, but the JSPS fellowship offered a window and a chance into that experience for me. I didn't have any direct contacts in Japan that would sponsor me, so I sent letters of inquiry to about 30 Japanese professors who I thought might be interested in hosting me. Only one of them responded to my letter, but that single chance made all the difference in my career at that time. Working with Professor Shinya Maenosono at the Japan Advanced Institute of Science and Technology (JAIST), I was able to receive a 1 year JSPS fellowship to work in his laboratory as a postdoctoral researcher. So, in July of 2009 I set out from New York to Japan with no idea what to expect and only what I could fit in a single suitcase. The following year was a whirlwind of excitement, research, unique experiences and learning more than I had at any time in my previous education.

That first year with professor Maenosono went very quickly, and I had to start considering my next moves. I was very lucky once again here as there was a new opening in the Maenosono laboratory for an Assistant Professor. Since I had worked with Prof. Maenosono for a year already, I was a natural fit to fill the position, and I was able to seamlessly continue my research with the Maenosono lab for the next 8 years. I had many more wonderful experiences there and learned much in my time at JAIST, but all too quickly time marches on. My 8 years in Ishikawa marked not only many research accomplishments, but my marriage to a wonderful woman who also works in chemistry, many trips abroad to present in scientific conferences, and of course meeting friends and family in Japan to introduce them to all of the incredible experiences here.

My time in JAIST was limited, but my wife and I were both fortunate to find opportunities for research here at Tohoku University. Hers at IMRAM, studying under Professor Kasai as an Assistant Professor, and mine with Professor Hibara as a Project Assistant professor. This was a new city and a new field of study for me, but I found not only the research to be engaging, but the city of Sendai as well. Since arriving in the Tohoku area, I have become very accustomed to the people, the shops and markets, the pace of life here, the easy access to Tokyo and even the pedestrian and bicycle paths through the city.

Finally this leads me to today, after working with Professor Hibara for several years he introduced me to Professor Watanabe and the FGL Program. I was able to apply for a position as a Specially Appointed Associate Professor and the rest is history. I have now been with the FGL for just over a year and have very much enjoyed sharing not only chemistry and science with a new generation of bright young students, but also the unique culture and experiences of Japan.

Were there any key experiences growing up or during your education that helped inspire and motivate you?

I definitely have several important and memorable experiences from my youth that helped motivate me and propel me forward in my studies and career. First was the ability to travel to France with my aunt at a young age. This left a very great impression on me and I think is a big reason why I pursued science (to expand my knowledge of the world) and also worked to find a job overseas.

A second experience that shaped my desire to experience a new place and culture happened during my graduate studies. At the time my cousin was attending a small college in central New York that for some reason had a large population of students from Japan. He had befriended many of them and they invited him to visit them in Japan (around 2006 or so). My cousin ended up inviting me on this trip and we spent two weeks in Japan exploring Yokohama, Tokyo and even traveling to Shikoku to visit a small school there started by an entrepreneur from our hometown. This short trip left a great impression on me, it was the first time I had visited Asia and the culture was unlike anything I had experienced before. Everything was new and influential. I remember the first evening we went to the onsen, and it is hard to express how much this simple activity opened my mind to how different cultures can be. I knew then that I wanted to return to Japan and experience as much as I could.

A third experience also happened during my graduate studies at SUNY Binghamton. While skeptical of my chances, I had applied for a unique event called the “Lindau Meeting of Nobel Laureates” in Lindau, Germany. The event brought together Nobel prize winners from across the globe, offered presentations on their award-winning fields, and also collected students together to talk and interact with each other and the Nobel Laureates. I was quite surprised to find that I was awarded a spot to participate in the meeting. I traveled to Germany with a delegation of United States graduate students and spent a week talking, eating (and even drinking) with some of the most brilliant minds in science. It was an experience I will never forget, and the people I traveled with and met at the conference have become lifelong friends and associates.

How do you stay motivated throughout your day/week/life and maintain work-life balance?

This is a challenge that I think is on everyone's mind working in the sciences. My philosophy is that we only have one life. It is important to make the time for experiences, exploration and all of the other "non-work" things you want to do. For me, time budgeting is important. I will list out what I want to accomplish in a given week, set up specific times to tackle those tasks, and then execute the timetable. Sometimes this is disrupted by unexpected experimental results, or some tasks taking longer than expected, but if I do my best to stick to my schedule then I always have time left over to pursue my other interests like learning more Japanese, hiking, cycling, photography, etc.

What has been the most rewarding aspect of your career?

The most rewarding thing to me specifically has been the opportunity to travel and see so much of the world. The pursuit of fundamental research has brought me to places such as San Francisco USA, Nice France, Strasbourg Germany, Okayama Japan, Taormina Italy, Barcelona Spain, London England, and a host of other cities across the globe. A close second though is the opportunity to share knowledge and excitement for science with other researchers, especially younger students who are just starting to explore this area for themselves.

Do you have any advice for the students that are now exploring their life and experiences in the bigger world?

At this time in your life, get as many experiences as you can. Whether visiting the Sendai morning market at 7AM, or traveling to an overseas conference, take every opportunity you can to explore the world around you. As you learn more from your coursework, experiences will give you very valuable context to these subjects and will help you decide where you want to go next in your career. No matter which path you choose, these new experiences will always be with you and will be increasingly valuable in your life.

Thank you for sharing your story!

Transportation Guide In Sendai

Written by Dylan and Kamila

In Sendai, there are a lot of choices for transportation methods to travel around the city. However, newcomers to Sendai can get confused when given these methods of transportation. Therefore, this section will consider every available public transportation means and compare the pros and cons of them.

Transportation Mode

- **Bus**

Buses are commonly found almost everywhere around the city. The fares can start from 120 yen, depending on where you depart and arrive. The advantages of using buses is that buses are generally cheaper compared to using other transportation methods, like the subway or taxi. It is also easier to find a bus station regardless of the location. However, using a bus can take you more time compared to the subway, and the routes of the buses can be quite confusing sometimes since they are labeled with numbers. Tips on route numbers can be found on the official website of the Transportation Bureau City of Sendai.

URL: <https://www.kotsu.city.sendai.jp/english/bus/keitou.html>

- **Subway**

Subway is usually the most commonly used method by most people to travel around main locations in Sendai. It comes with a minimum fee of 210 yen, with varying prices depending on the station where you depart and arrive. The Sendai subway currently has two lines, the East-West line (Tōzai Line) and the North-South line (Namboku Line).

Subways are a lot faster to reach the destination than buses. If you want to move between campuses in Tohoku University, using the subway would take a maximum of around 10 minutes of time. It is also much simpler and easy to be understood for anyone to use and also always arrives on time. Trains are also available approximately every 7 minutes, so you do not have to wait long.

However, due to the minimum fare being 210 yen, using the subway for traveling only one station between the departure and arrival stations is not recommended, unless in certain cases where the distance between two stations is far enough (example being Aobayama and Kawauchi). Subways are also not available after midnight, so you need to consider using another transportation method if you find the need to travel after 12.00 PM.

(source:<https://4travel.jp/travelogue/11212415>)

Note: you can view the fees taken to travel to each station from the station you are currently in using the picture above the ticket machine on each station. (above prices are for adults while the bottom are for children).

- **Taxi**

Taxis are rarely used for common transportation, since it has a high starting fee (about 600 yen) and prices usually end around /* 000 yen per trip. However, taxis can be used as an option if you need a ride after midnight (as subway service is not available after midnight). Otherwise, it is not recommended to use it.

- **Other transportation options (bicycles)**

Most students who live around the heart of the city buy bicycles, which can help them save money as they do not have to take public transport. Other than that, owning a bicycle could allow you to reach places far from subway stations or bus stops easily.

Considering Sendai's terrain, students usually prefer electric assist bicycles to ease their commuting activities. Aside from the new ones, you can also buy some second-hand products which are still in good condition. You can usually buy second-hand from the flea market available for people in Sendai. (more info: <https://www.facebook.com/groups/287809048081690/>). An alternative for this online flea market is second hand stores such as Hard Off.

Depending on the quality and specifications, you can get a new electric bicycle for around 130,000 yen. The prices for used electric bicycles vary, generally starting from 65,000 yen. On the other hand, the new non-electric bicycles' prices generally start from 10,000 yen. However, for certain areas like Yagiyama or Aobayama, using bicycles may not be a good option to use during certain times of the year, especially in winter as students may find it hard to traverse the snowy road during it.

Payment Methods

Aside from using cash as a method of payment, Sendai also provides some convenient cashless payment systems for you. Two famous payment methods are SUICA and ICSCA cards, which are electronic money cards that you can make easily in the subway station's ticket vending machine or other places. Here are two things that you can do to make transportation payments more convenient!

- **SUICA or ICSCA Balance**

SUICA and ICSCA are the cards that you can use to pay for the Subway Namboku Line and Tozai Line, Loople Sendai, buses, and many other services. SUICA itself is designed for the JR EAST area. These cards can ease your travel in Sendai since you don't have to buy a physical ticket every time you take a trip.

One of the most common places to make SUICA or ICSCA is in the subway station's ticket vending machine. You will have to pay an extra 500 yen as an initial deposit. However, you don't need extra charges if you want to refill your balance.

To use it, you just have to tap your card on the IC card reader, which can be found on the ticket gate in subway stations or near the front door of buses. After arriving at your destination, you can also see the remaining balance of your SUICA or ICSCA card on the monitor.

In case of insufficient balance after taking a subway ride, you can use the Fare Adjustment Machine and insert the remaining balance needed to cover your previous trip. However, in some cases, too many people want to use it and resulting in a long queue. Therefore, it's recommended to make sure that your balance is enough before you go.

- **ICSCA Commuter Pass**

ICSCA provides a subscription method for a certain period. It's highly recommended to get an ICSCA commuter pass if you commute a lot or have to visit adjacent stations often to cut commuting fees. Some available options for it include the subway Tozai Line, Namboku Line, or Buses. The fees that you need to pay each month depends on your choice of route and your subscription type. ICSCA provides two options for subscription types which are student commuter pass and regular commuter pass. As a Tohoku University student, you can apply for the student commuter pass certificate in the FGL Office.

Depending on your commuting frequency, getting a student commuter pass could be cheaper than using ICSCA or SUICA balance. For instance, if you go to the campus 5 days a week for 4 weeks, you will need at least 8,000 yen a month. However, if you buy a student commuter pass for the subway Tozai Line—as an example—you only have to pay 6990 yen per month.

Further details regarding the fees and the procedure to get an ICSCA commuter pass can be found at this link: Public Transportation | TU Support – TOHOKU UNIVERSITY International Support Center –

(https://sup.bureau.tohoku.ac.jp/en/life-e/trans-e/#Commuter_Pass)

Once you get your commuter pass, you will notice that there will be no changes in your card balance when you tap it on the IC card reader. However, if your subscription will end in 2 weeks, the subscription expiration date will appear on the screen.

Those are some of the basic things you need to know about Sendai's transportation facilities. You are free to choose your own preference based on your needs and how you want to enjoy life in Sendai!

~Stay safe during your commute!~

Application of recent numerical methods for compressible complex turbulent multicomponent fluid

by Aziz Faizullah Abidin, 4th year IMAC-U

Interviewed by Sumaya and Avin

Q. Hello! Can you introduce your research and what it is about?

A. This research explores a way to study how different things mix in fluids (like water or air) called "multicomponent flow." It is important because fluids are vital components in many natural phenomena such as cloud formation and climate change, and industrial processes like water treatment through rapid mixing, and gas mixtures for breathing during anesthesia administration. Understanding multicomponent flow can lead to better design and optimization of these processes, and ultimately lead to better control and management of our environment and industries.

Q. Can you explain the methods used for simulating multicomponent flow?

A. Multiple numerical methods have been built to address the challenges faced in simulating multicomponent flow. These methods focus on fulfilling pressure equilibrium at the interface between components. We used a computer program to do these studies, and we looked at a special problem called the Taylor Green Vortex. This is like a box that has a really chaotic flow inside. We only needed to study a part of it, yet it helps us understand how things mix together. I show two figures of the flow density contour. Figure 1 shows the generally stable start with the yellow circles showing the vortex. Figure 2 shows the turbulent/chaotic flow as the simulation continues.

Q. What are some challenges faced when dealing with multicomponent flow simulations?

A. When we study multicomponent flow, we must be careful because different things can mix in different ways. We have to make sure that they mix together correctly, or we might get invalid results in our study. Therefore, we have come up with different ways to do these studies, but not all of them work well. In this study, we looked at new ways to study multicomponent flow, especially when it is very complex and turbulent (which means it's moving around a lot). This unstable flow would normally cause the simulation to crash if even relatively small errors were to appear, as they would be magnified substantially by the turbulent nature of the flow. We also looked at something called "entropy," which measures how chaotic or disordered a system is. This helped us understand more about the mixing process.

Q. What is the significance of your research in the field of computational fluid dynamics?

A. Though this research does not consider all possible phenomena, it helps us better understand how things mix in fluids, especially when it is very complex and turbulent. By finding the best method to study it, we can get more accurate results and make better decisions based on those results. Eventually, I conclude that the most consistent method is based on the proposed numerical method for multicomponent complex turbulent flow simulations.

Q. What are your prospects towards research in future? Do you want to work on the same topic or look for a new area in the field?

A. Currently I am looking to further analyze the results as the concept of mixing entropy is rather hard to grasp, especially in terms of entropy preservation (i.e. what is the best way to quantify entropy), as there are several theories which explain the concept of entropy. The use of advanced technologies, such as artificial intelligence and big data analytics, is expected to enhance research outcomes and generate new knowledge in various fields, so I want to incorporate some of that in my future research.

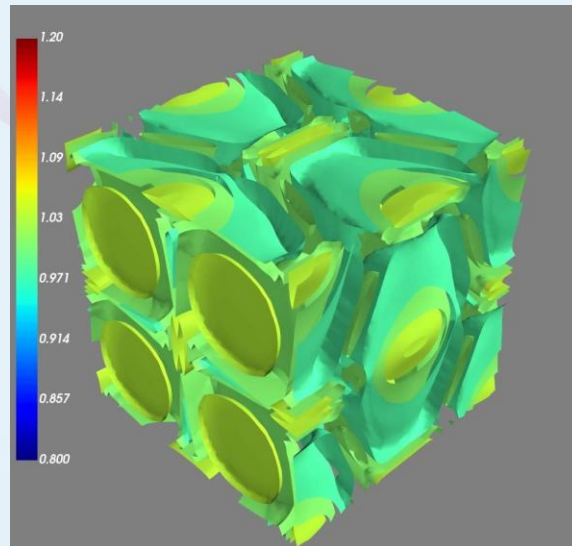


Figure 1: The generally stable start with the yellow circles showing the vortex.

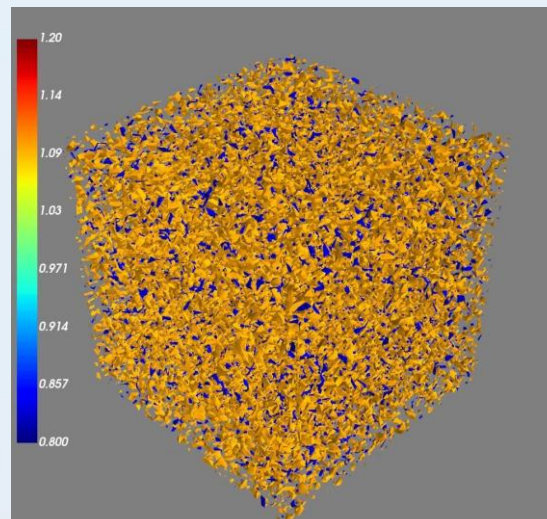


Figure 2: The turbulent/chaotic flow as the simulation continues.

The background of the page features a detailed illustration of cherry blossom branches with pink and white flowers, extending from the top right towards the center. The main text area is a light blue rectangle with a subtle floral pattern, and the title is in a green box at the top left.

How the Japanese Government's Push for Internationalization Sparked the Formation of FGL at Tohoku University

Written by Rawin and Suryo

Roughly 10 years ago, the Japanese academic community experienced a great leap forward: international programs popped up, more international students came to campuses, and more international professors were hired in many traditional Japanese universities. Not so long before, tens of Japanese top-notch universities had eagerly strived to establish English-based, degree-granting programs ready to welcome international students to their campus.

The University of Tokyo, Kyoto University, Nagoya University, and many more went to open courses specialized for international students. As you can guess, one university among them is Tohoku University, widely recognized as the best in Japan's Northeastern Region and one of the seven imperial universities in Japan. In 2009, Tohoku University was selected as one of 13 universities of the Global 30 program, also known as G30 by the Japanese government and established the Future Global Leadership program (FGL program), where students pursue undergraduate or graduate degrees in English.

The Global 30 program is a funding project that aims to promote internationalization of the academic environment of Japanese universities and acceptance of excellent international students studying in Japan. The selected 13 core universities have been implementing a variety of approaches to internationalize academic systems and campuses such as developing degree programs conducted in English and enriching international student support, while they are expected to enhance inter-university networks for sharing educational resources and other output including establishment of overseas offices which can be jointly used by all Japanese universities.

Tohoku University initiated a plan to build three international courses spread over its three departments: Advanced Molecular Chemistry in the Faculty of Science, International Mechanical and Aerospace Engineering in the School of Engineering and Applied Marine Biology in the Faculty of Agriculture. Each department prepared to offer courses as well as introduce its academic support in English. The university also got ready to accept a new batch of students – promoting the program, reviewing and accepting applications, and then sending out admission offers.

Although the G30 program was ended after 5 years, the Japanese government has launched the Top Global University Project (スーパーグローバル大学創成支援). The Top Global University Project is a funding project that aims to enhance the international competitiveness of higher education in Japan. It provides support for world-class and innovative universities that lead the internationalization of Japanese universities with programs to encourage and deepen interactions and partnerships among the academic elite, reforming personnel and educational systems, enhancing educational systems to help students develop the ability to act globally and accelerating other globalization initiatives. Under the Top Global University Project, 13 universities were selected as Type A (Top Type) universities that are conducting world-leading education and research and 24 universities were selected as Type B (Global Traction Type) universities that are leading the globalization of Japanese society.

This time, Tohoku presented the plan of Tohoku University Global Initiative, which included FGL as its key part of nurturing an international environment in its ecosystem. As a result, Tohoku University was among the 13 universities that won the grant in the "Type A" category. This Top Type is for world-class universities that have the potential to be ranked in the top 100 in world university rankings. Every university of this type receives a certain amount of budget to use in its project. With this continuous support from the Government of Japan, Tohoku University managed to continue the FGL program smoothly up to today.

As students of Tohoku University, we the authors are extremely proud of the university's commitment to internationalization and its participation in the Global 30 and Top Global University Project. These initiatives have provided us with the opportunity to study in a globally diverse environment and equipped me with the skills and knowledge necessary to succeed in today's interconnected world. Overall, we feel fortunate to be a part of such a dynamic and forward-thinking community and are excited to see what the future holds for Tohoku University.

Follow us on SNS!



@FGL_COMMUNITY_TU



TU FGL Community



Newsletter published by the FGL
Community of Tohoku University



Mascot design by Sera Koo

Other contributions:

Introduction paragraph by Wei Wei

Article proofreading by Ryan

Layout editing by Steven