The 9th Asia-Pacific Rim Conference on

# Rheology

## Theme :
## Progress and Future of Rheology

A-PRCR 2025

July 20-25, 2025
Kobe JAPAN

# CONTENTS

# Chair's Welcome

On behalf of members of society of rheology of Japan, I would like to express my gratitude for your participating Asia-Pacific Rim Conference on Rheology (A-PRCR 2025) in Kobe. The Society of Rheology, Japan, was founded in 1973 and consists of more than 500 personal rheologists. We are actively studying rheological problems and discussing them in our national conferences. Then, it is our great pleasure to co-host this A-PRCR. Please enjoy the presentations and discussions in the conference in Kobe.

Kobe was the capital city of Japan in 1180. The grand minister, Kiyomori Taira at that time opened an international port in Kobe and he thought the capital city should be near the port. Then, he moved the capital city from Kyoto to Kobe. However, Taira family was defeated by Minamoto family just after the capital transfer. After that, Kobe had fallen in ruin for a long time. In 1868, Kobe was widely opened for foreign countries as an international port again and was developed as the biggest international port city in Japan. Kobe accepted a lot of foreign people and cultures. Especially, high-quality western sweets have been produced in Kobe. Then, Kobe became the most attractive international city in Japan. Unfortunately, the big earthquake attacked Kobe in 1995. However, Kobe has been reconstructed by the great efforts of Kobe citizens as being a more exciting international city.

As you know well, Kobe is famous for its beef. You can find the best beef in Kobe in the world though it is very expensive. Kobe is also famous for its pearls. Kobe has a big mountain near the big port. The reflection light from the mountain is suitable for the evaluation of pearls. Pearls imported from all over the world are evaluated in Kobe and are exported to all over the world. One of the most exciting products for rheologists is shoes. We call Kobe 'Hakidaore', which means 'ruining yourself by extravagance in shoes'. This is because Kobe is the birthplace of rubber products in Japan. Then, many rheologists are working in Kobe for rubber products. Please enjoy Kobe as well as the Conference.

Prof. Hiroshi Suzuki, Dr. Eng.
President, the Society of Rheology, Japan
Department of Chemical Science and Engineering
Kobe University

Rheology is the scientific study of the flow and deformation characteristics of materials under external forces. It has evolved since the early 1900s as the materials used by humans have become more complex, shifting from ceramics, glass, and metals to include rubber, plastics, liquid crystals, and dispersions. Today, rheology is an essential academic field not only for understanding natural phenomena but also for evaluating material properties, optimizing manufacturing processes, developing new materials, and ensuring quality control in industries such as polymer processing, paints, inks, cosmetics, and food.

The worldwide congress for Rheology researchers began in 1948 with the International Congress on Rheology, ICR, organized by The International Committee on Rheology (ICR). This conference has been held every four years (every five years until the fifth congress). The Pacific Rim Conference on Rheology (PRCR) was proposed by the late Professor Toshio Masuda of Kyoto University to provide a forum for rheology researchers in the Pacific Rim region during the interim years. The first PRCR (correctly PCR) was held in Kyoto in 1994, followed by the second in Melbourne, Australia (PRCR-2, 1997), the third in Vancouver, Canada (PRCR-3, 2001), the fourth in Shanghai, China (PRCR-4, 2005), the fifth in Sapporo, Japan (PRCR-5, 2010), the sixth again in Melbourne, Australia (PRCR-6, 2014), the seventh in Jeju Island, South Korea (PRCR-7, 2018), and the eighth again in Vancouver, Canada (PRCR-8, 2023). This time, for the ninth PRCR, the conference will be held in Japan for the third time. With India joining the conference from this year, the name has been changed to the Asia-Pacific Conference on Rheology.

We warmly welcome broad participation from anyone interested in rheology, not limited to those from the Asia-Pacific Rim region.

Tadashi Inoue
The University of Osaka
Chairperson of the Organizing Committee

# Plenary Lectures

## Plenary Speakers

**Plenary1**：July 21,8:40
**Professor Sehyun SHIN**
Korea University, Korea
Innovating the Rheology of Life: Microfluidic Insights into Erythrocytes, Platelets, and Coagulation Dynamics

**Plenary2**：July 21,13:10
**Professor Dimitris VLASSOPOULOS**
Foundation for Research and Technology - Hellas (FORTH) and University of Crete, Greece
Normal Stresses in Viscoelastic Fluids

**Plenary3**：July 22,8:30
**Professor Viswanathan KUMARAN**
Indian Institute for Science, India
Multiscale Modeling of Sheared Lamellar Mesophases: The Structure-Rheology Relationship

**Plenary4**：July 22,13:10
**Professor Prabhakar RANGANATHAN**
Monash University, Australia
Building and Testing Constitutive Models for Unentangled Solutions of Polymers in Newtonian Solvents

**Plenary5**：July 23,8:30
**Professor Jinjun ZHANG**
China University of Petroleum-Beijing, China
Rheological Behavior of Waxy Crude Oils and its Application in Pipeline Transportation

**Plenary6**：July 24,8:30
**Professor Milana TRIFKOVIC**
University of Calgary, Canada
Scale-Dependent Rheology of Complex Fluids for Energy and Biomedical Solutions

**Plenary7**：July 24,13:10
**Professor Takamasa SAKAI**
The University of Tokyo, Japan
Tetra Gels for Understanding Fundamentals of Gels

# Keynote Speakers

## G1. Materials Processing

**Toshio Tada** (Sumitomo Rubber Industries, Ltd. (Japan)
4D07：July 24,14:25

## G2. Non-Newtonian Fluid Mechanics & Microfluidics

**J. Esteban Lopez-Aguilar** (National Autonomous University of Mexico (Mexico))
1A01：July 21,10:00

**Vincenzo Calabrese** (Okinawa Institute of Science and Technology (Japan))
2A01：July 21,9:50

## G3. Supramolecules & Self-Assembling Systems

**Hiroshi Watanabe** (Kyoto University (Japan))
2C01：July 22,9:50

## G4. Solids, Surface, Composite & Multiphase Systems

**Yusuke Hiejima** (Kanazawa University (Japan))
4B01：July 24,9:50

## G5. Polymer Solutions, Melts & Blends

**Yuya Doi** (Yamagata University (Japan))
2C07：July 22,14:25

**Youngdon Kwon** (Sungkyunkwan University(Korea))
4C01：July 24,9:50

## G6. Suspensions, Colloids & Granular Systems

**Bo Yao** (China University of Petroleum (East China) (China))
2D01：July 22,9:50

**Soichiro Makino** (Toyota Central R & D Labs., Inc. (Japan))
2D07：July 22,14:25

## G7. Computational Rheology

**Xue-Feng Yuan** (Guangzhou University (China))
1E01：July 21,10:00

**Ellie Hajizadeh** (The University of Melbourne (Australia))
1E07：July 21,14:25

## G8. Living and Active Systems

**Manlio Tassieri** (The University of Glasgow (UK))

1D07：July 21,14:25

## G9. Interface, Droplet, Emulsions & Foams

**Walter Richtering** (RWTH Aachen University (Germany))

2E07：July 22,14:25

**Tadashi Kajiya** (Fujifilm(Japan))

3E01：July 23,9:50

## G10. Bio-Related Materials & Bio/Medical-Rheology

**Toru Maruyama** (Haradoi Hospital (Japan))

1B01：July 21,10:00

**Michael J Simmonds** (Griffith University (Australia))

1B07：July 21,14:25

## G11. Food Rheology

**Shuji Fujii** (Toyo University (Japan))

2B05：July 22,11:10

## G12. Gels and Rubbers

**Thanh-Tam Mai** (Kyoto University (Japan)

3B01：July 23,9:50

**Wei Yu** (Shanghai Jiao Tong University (China))

4A01：July 24,9:50

**Zuowei Wang** (University of Reading (UK))

4A07：July 24,14:25

## G13. Experimental Techniques

**Wook Ryol Hwang** (Gyeongsang National University (Korea))

1D01：July 21,10:00

## G14. General Rheology

**Vimal Katiyar** (Indian Institute of Technology Guwahati (India))

1C07：July 21,14:25

# Social Events (Overview)

## Check-in and Info Table

Time：July 20, 15:00–20:00 (prior to Welcome Reception)

08:00–until the end of the day's sessions, July 21–24

Location：3rd Floor, Kobe International Conference Center

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## Welcome Reception

Time：July 20, 18:00 (Open 17:30)

Location：Ariston Hotel, 16th Floor, Barcelona Room

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## Excursion

Assembly time：July 23, 12:50

Assembly point：Room A (Main Hall)

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## Banquet

Time：July 23, 18:00 (Open 17:30)

Location：Portopia Hotel, Main Building B1F, "Kairaku-no-ma"

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## Scan here for more information:

URL：https://pub.confit.atlas.jp/en/event/prcr2025/content/Notice

# Important Information

**1. Registration** (July 20, 15:00–20:00, and until July 24 at the 3rd Floor of the International Conference Center)

Please receive your name badge and conference bag at the registration desk. Your name badge includes your ticket for the Conference Banquet. It also indicates your excursion course and bus number — please confirm these details.

“On-site registration” refers to online registration with credit card payment at the venue. However, we strongly recommend completing your registration and payment online in advance to ensure smooth participation.

Please note: Registrations completed after July 20 will be subject to the on-site registration fee.

Last-minute registrations may not guarantee availability for the excursion or the Conference Banquet.

**2. Cloakroom**

Available in Rooms 306 and 307 on the 3rd Floor. Please collect your items before the end of each day (by 20:00 on July 20, and within 30 minutes after the program ends on other days).

**3.Wi-Fi**

Available at the Internatinal Conference Center

SSID：A-APRCR2025

Password：kobe2025

**4. Reception** (July 20, 18:00– at Barcelona Room, Ariston Hotel 16th Floor,)

Entry with name badge only. Light refreshments and drinks will be served.

**5. Presentation**

There will be no preview room. Please check your presentation during the break time prior to your session.

Also, please assist the session chair by confirming your attendance in advance.

**6. Tea Breaks** (after Plenary Talks and before Poster Sessions)

9:30–9:50 (9:40–10:00 on July 21) & 14:10–14:25 (except July 23)

Location: 3rd Floor Lounge

Coffee, tea, and cold beverages will be provided.

**7. Lunch** (July 21–24, 12:00–13:00 at 3rd Floor Lounge)

Buffet style. Entry with name badge. Please note that there are limited restaurant options nearby.

**8. Poster Sessions** (July 21 & 22, 16:30–18:00 at 4th Floor, Rooms 401+402)

Presenters are requested to set up their posters by 15:00. Push pins will be provided.

Beverages will also be available.

**9. Excursion** (Afternoon of July 23)

Participants with prior registration may join with their name badge. Please check your assigned course, bus number, **meeting time(12:50)**, and **meeting place (Room A, convention center)** on your badge.

Bus waiting areas will be indicated inside Room A by bus number.

*Please note that if you do not arrive at the designated meeting time, your excursion reservation will be considered canceled.*

Return buses will make a brief stop near "Sannomiya Station" before proceeding to the Portopia Hotel (the Conference Banquet venue). Participants who wish to return to their hotels first may disembark there and later use the Port Liner to reach the banquet venue.

**10. Conference Banquet** (July 23, 18:00–20:00 at "Kairaku-no-ma", Main Building B1F, Portopia Hotel)

Banquet ticket required.

*To ensure accurate meal service, guests who have requested vegetarian or halal-friendly options will be assigned designated tables. We kindly ask guests with regular meal preferences to avoid these tables.*

**11. KARAOKE Party** (July 23, 20:30–22:30 at Party Room "Key Notes", South Wing 3F, Portopia Hotel)

"Karaoke" will be available for those who struggle to fall asleep without singing. Entry with name badge.

# A-PRCR 2025 Program Overview

**July 20 (Sun), 2025**

| | Room A (Main Hall) | Room B (301) | Room C (501) | Room D (502) | Room E (504&505) |
|---|---|---|---|---|---|
| 15:00 - 18:00 | **Registration** | | | | |
| 18:00 - 20:00 | **Welcome Reception** | | | | |

**July 21 (Mon), 2025**

| | Room A (Main Hall) | Room B (301) | Room C (501) | Room D (502) | Room E (504&505) |
|---|---|---|---|---|---|
| 8:30 - 8:40 | **Opening remark** | | | | |
| 8:40 - 9:40 | **Plenary 1**<br>**Innovating the Rheology of Life: Microfluidic Insights into Erythrocytes, Platelets, and Coagulation Dynamics**<br>***SeHyun Shin (Korea University (Korea))** | | | | |
| 9:40 - 10:00 | Break | | | | |
| 10:00 - 10:20 | G2. Non-Newtonian Fluid Mechanics & Microfluidics | G10. Bio-Related Materials & Bio/Medical-Rheology | G14. General Rheology | G13. Experimental Techniques | G7. Computational Rheology |
| 10:20 - 10:40 | | | | | |
| 10:40 - 11:00 | | | | | |
| 11:00 - 11:20 | | | | | |
| 11:20 - 11:40 | | | | | |
| 11:40 - 12:00 | | | | | |
| 12:00 - 13:10 | Lunch | | | | |
| 13:10 - 14:10 | **Plenary 2**<br>**Normal Stresses in viscoelastic fluids**<br>***Dimitris Vlassopoulos[1], Benke Li[2], Thanasis Athanasiou[2], Antonios Mavromanolakis[2] (1. University of Crete and FORTH (Greece), 2. FORTH (Greece))** | | | | |
| 14:10 - 14:25 | Break | | | | |
| 14:25 - 14:45 | G2. Non-Newtonian Fluid Mechanics & Microfluidics | G10. Bio-Related Materials & Bio/Medical-Rheology | G14. General Rheology | G8. Living and Active Systems | G7. Computational Rheology |
| 14:45 - 15:05 | | | | | |
| 15:05 - 15:25 | | | | | |
| 15:25 - 15:45 | | | | | |
| 15:45 - 16:05 | | | | | |
| 16:05 - 16:25 | | | | | |
| 16:25 - 16:30 | Break | | | | |
| 16:30 - 18:00 | **Poster 1**<br>**(Room 401 & 402)** | | | | |

**July 22 (Tue), 2025**

| | Room A (Main Hall) | Room B (301) | Room C (501) | Room D (502) | Room E (504&505) |
|---|---|---|---|---|---|
| 8:30 - 9:30 | **Plenary 3**<br>**Multiscale Modeling of Sheared Lamellar Mesophases: The Structure-Rheology Relationship**<br>***Viswanathan Kumaran (Indian Institute of Science (India))** | | | | |
| 9:30 - 9:50 | Break | | | | |
| 9:50 - 10:10 | G2. Non-Newtonian Fluid Mechanics & Microfluidics | G11. Food Rheology | G3. Supramolecules & Self-Assembling Systems | G6. Suspensions, Colloids & Granular Systems | G7. Computational Rheology |
| 10:10 - 10:30 | | | | | |
| 10:30 - 10:50 | | | | | |
| 10:50 - 11:10 | | | | | |
| 11:10 - 11:30 | | | | | |
| 11:30 - 11:50 | | | | | |
| 11:50 - 13:10 | Lunch | | | | |
| 13:10 - 14:10 | **Plenary 4**<br>**Microstructure-based Constitutive Modeling of Unentangled Polymer Solutions**<br>***Prabhakar Ranganathan (Monash University (Australia))** | | | | |
| 14:10 - 14:25 | Break | | | | |
| 14:25 - 14:45 | G2. Non-Newtonian Fluid Mechanics & Microfluidics | G11. Food Rheology | G5. Polymer solutions, melts & Blends | G6. Suspensions, Colloids & Granular Systems | G9. Interface, Droplet, Emulsions & Foams |
| 14:45 - 15:05 | | | | | |
| 15:05 - 15:25 | | | | | |
| 15:25 - 15:45 | | | | | |
| 15:45 - 16:05 | | | | | |
| 16:05 - 16:25 | | | | | |
| 16:25 - 16:30 | Break | | | | |
| 16:30 - 18:00 | **Poster 2**<br>**(Room 401 & 402)** | | | | |

**July 23 (Wed), 2025**

| | Room A (Main Hall) | Room B (301) | Room C (501) | Room D (502) | Room E (504&505) |
|---|---|---|---|---|---|
| 8:30 - 9:30 | **Plenary 5**<br>**Rheological Behavior of Waxy Crude Oils and its Application in Pipeline Transportation**<br>***Jinjun Zhang、Hongying Li、Yiwei Xie (China University of Petroleum- Beijing (China))** | | | | |
| 9:30 - 9:50 | Break | | | | |
| 9:50 - 10:10<br>10:10 - 10:30<br>10:30 - 10:50<br>10:50 - 11:10<br>11:10 - 11:30<br>11:30 - 11:50 | G2. Non-Newtonian Fluid Mechanics & Microfluidics | G12. Gels and Rubbers | G5. Polymer solutions, melts & Blends | G6. Suspensions, Colloids & Granular Systems | G9. Interface, Droplet, Emulsions & Foams |
| 11:50 - 13:00 | Lunch | | | | |
| 13:00 - 18:00 | **Excursion** | | | | |
| 18:00 - 21:00 | **Banquet** | | | | |

**July 24 (Thu), 2025**

| | Room A (Main Hall) | Room B (301) | Room C (501) | Room D (502) | Room E (504&505) |
|---|---|---|---|---|---|
| 8:30 - 9:30 | **Plenary 6**<br>**Scale-Dependent Rheology of Complex Fluids for Energy and Biomedical Solutions**<br>***Milana Trifkovic (University of Calgary (Canada))** | | | | |
| 9:30 - 9:50 | Break | | | | |
| 9:50 - 10:10<br>10:10 - 10:30<br>10:30 - 10:50<br>10:50 - 11:10<br>11:10 - 11:30<br>11:30 - 11:50 | G12. Gels and Rubbers | G4. Solids, Surface, Composite & Multiphase systems | G5. Polymer solutions, melts & Blends | G1. Materials Processing | G9. Interface, Droplet, Emulsions & Foams |
| 11:50 - 13:10 | Lunch | | | | |
| 13:10 - 14:10 | **Plenary 7**<br>**Tetra Gels for Understanding Fundamentals of Gels**<br>***Takamasa Sakai (Graduate School of Engineering, University of Tokyo (Japan))** | | | | |
| 14:10 - 14:25 | Break | | | | |
| 14:25 - 14:45<br>14:45 - 15:05<br>15:05 - 15:25<br>15:25 - 15:45<br>15:45 - 16:05<br>16:05 - 16:25<br>16:25 - 16:45<br>16:45 - 17:05 | G12. Gels and Rubbers | G4. Solids, Surface, Composite & Multiphase systems | G5. Polymer solutions, melts & Blends | G1. Materials Processing | |

**July 25 (Fri), 2025**

| | Room A (Main Hall) | Room B (301) | Room C (501) | Room D (502) | Room E (504&505) |
|---|---|---|---|---|---|
| 8:30 - 12:00 | **Free Discussion** | | | | |

# Session Organizer

## G1. Materials Processing

**Organizers**：Patrick Lee, Jaewook Nam, Masayuki Yamaguchi

## G2. Non-Newtonian Fluid Mechanics & Microfluidics

**Organizers**：Ian Frigaard, V.Shankar, Simon Haward, Ruri Hidema

## G3. Supramolecules & Self-Assembling Systems

**Organizers**：Giovanniantonio Natale, Ping Tang, Takehiro Yamamoto

## G4. Solids, Surface, Composite & Multiphase systems

**Organizers**：Guruswamy Kumaraswamy, Joung Sook Hong, Shogo Nobukawa

## G5. Polymer solutions, melts & Blends

**Organizers**：Ravi Jagadeeshan, Cheng-Yang Liu, Sathish K.Sukumaran

## G6. Suspensions, Colloids & Granular Systems

**Organizers**：Prachi Thareja, Yoshiyuki Komoda

## G7. Computational Rheology

**Organizers**：Elnaz (Ellie) Hajizadeh, Takashi Uneyama

## G8. Living and Active Systems

**Organizer**：Takashi Taniguchi

## G9. Interface, Droplet, Emulsions & Foams

**Organizers**：Seyed Mohammad Taghavi, Tutomu Takahashi

## G10. Bio-Related Materials & Bio/Medical-Rheology

**Organizers**：Michael Simmonds, Toru Maruyama, Nobuo Watanabe

## G11. Food Rheology

**Organizers**：Akihiro Nishioka, Tomonori Koda, Hiroko Yano

## G12. Gels and Rubbers

**Organizers**：Wei Yu, Abhijit P Deshpande, Kenji Urayama, Takuya Katashima

## G13. Experimental Techniques

**Organizers**：Nicole Demarquette, Qian Huang, Kyu Hyun, Yumi Matsumiya

## G14. General Rheology

**Organizers**：Quan Chen, Junichi Horinaka

## Poster Session

Osamu Urakawa

# Excursion

We are planning to offer the following **three** courses in the afternoon of July 23, 2025.

## Couse 1　Himeji Castle

**Himeji Castle**, located in Hyogo Prefecture, is one of Japan's most iconic and well-preserved castles. Often referred to as the "White Heron Castle" due to its elegant, bird-like appearance, it is renowned for its brilliant white exterior and complex, multi-layered defensive structures. Built in the early 17th century, Himeji Castle is a UNESCO World Heritage Site and stands as a prime example of traditional Japanese castle architecture. It is also a popular tourist destination, attracting visitors from around the world who come to admire its beauty and historical significance.

## Course 2 Arima Spa & Nada Sake Brewery Tour

**Arima Onsen**, located in the mountains of Kobe, is one of Japan's oldest and most famous hot spring resorts. Known for its therapeutic waters, Arima Onsen offers two types of hot springs: "Kinsen" (golden water) rich in iron, and "Ginsen" (silver water) containing radium and carbonate. The area is popular for its traditional inns, relaxing hot spring baths, and scenic surroundings, providing visitors with a peaceful retreat.

**The Nada district**, located in Kobe, Hyogo Prefecture, is famous for its sake production and is home to some of Japan's most renowned sake breweries. The region's ideal climate, high-quality rice, and pure spring water from the

Rokko Mountains contribute to the exceptional flavor of Nada's sake. Visitors can enjoy brewery tours, learn about the traditional sake-making process, and taste a variety of sake at different breweries. The Nada Sake Brewery Tour offers a unique cultural experience, blending history, craftsmanship, and the rich flavor of Japan's finest sake.

## Course 3 Kobe City Tour

**Rokko Pasture**, located in the Rokko Mountains near Kobe, is a scenic spot where visitors can interact with farm animals like cows, sheep, and goats. The ranch offers hands-on experiences such as animal feeding, milking demonstrations, and sheepdog performances. Visitors can also enjoy fresh dairy products, including cheese and ice cream made on-site. It's a popular destination for families and nature lovers looking to relax in a peaceful environment.

**Nunobiki Herb Garden**, located on the slopes of Mount Rokko in Kobe, is Japan's largest herb garden. Accessible by ropeway, the garden offers stunning views of Kobe and the surrounding area. It features a wide variety of herbs and flowers, along with themed gardens, greenhouses, and walking trails. Visitors can also enjoy herbal teas, fragrances, and various herb-related products. It's a popular spot for nature lovers and those seeking a peaceful retreat amidst beautiful scenery.

**The Kitano Ijinkan** district in Kobe is famous for its historic Western-style houses, known as "Ijinkan," which were built in the late 19th and early 20th centuries for foreign residents. These charming, European-style buildings are now preserved as museums and cultural attractions, offering a glimpse into the lifestyle of foreign settlers during the Meiji and Taisho periods. The area is popular with tourists for its unique architecture and historical significance.

# A-PRCR 2025 Committee Members

## Conference Chair

| | |
|---|---|
| Tadashi Inoue | The University of Osaka |

## Honorary Chair

| | |
|---|---|
| Hiroshi Watanabe | Kyoto University/Changchun Institute of Applied Chemistry, Chinese Academy of Sciences |

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|---|---|
| Junichi Horinaka | Kyoto University |
| Shogo Nobukawa | Nagoya Institute of Technology |

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| | |
|---|---|
| Yoshiyuki Komoda | Kobe University |

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| Hiroshi Suzuki | Kobe University |
| Sathish K. Sukumaran | Yamagata University |
| Katsuhisa Tokumitsu | The University of Shiga Prefecture |
| Takashi Uneyama | Nagoya University |
| Osamu Urakawa | The University of Osaka |
| Takehiro Yamamoto | Osaka Electro-Communication University |
| Nobuo Watanabe | Shibaura Institute of Technology |

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| Yuichi Masubuchi | Nagoya University |
| Xue-Feng Yuan | Guangzhou University |

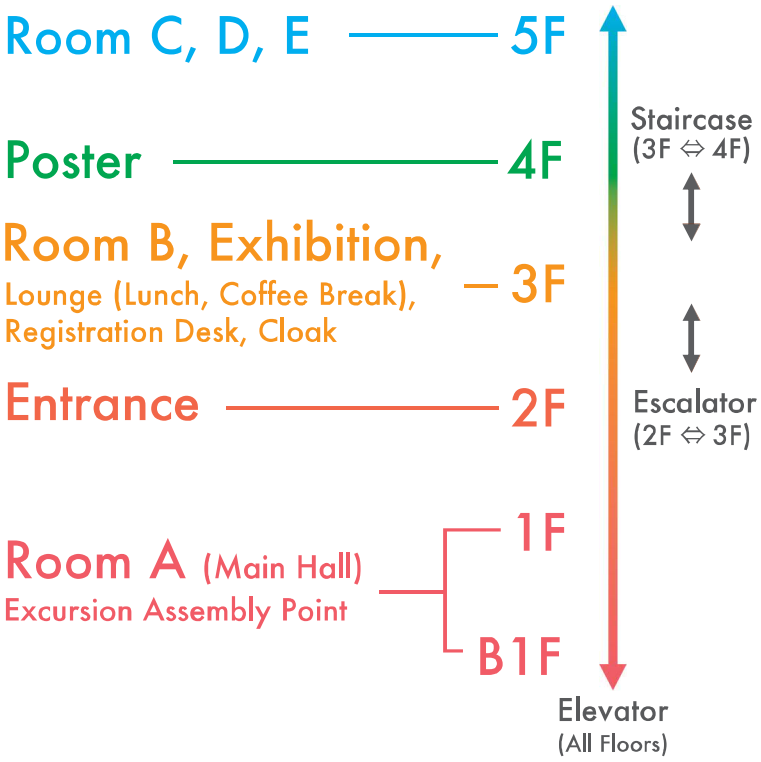
# Access Map

## Location of the venue — The 9th Asia-Pacific-

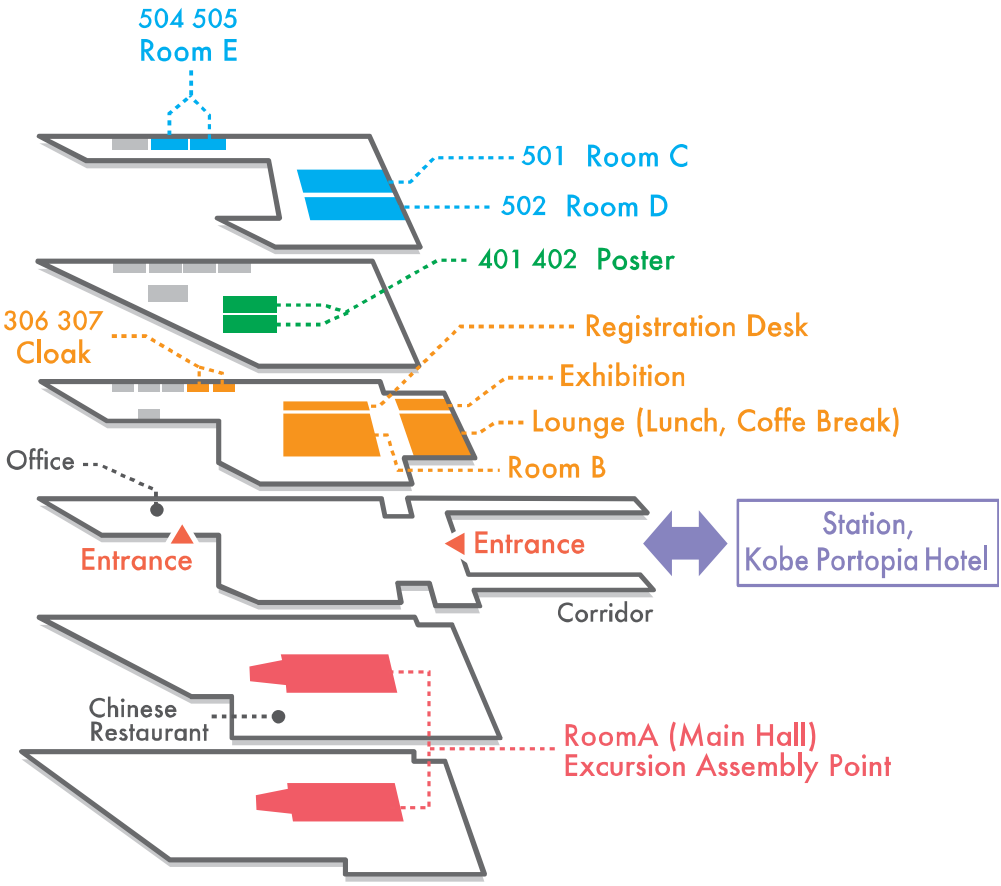
Rim Conference on Rheology (A-PRCR2025)

# Kobe International

## Venue Map



# Conference Center



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SEKISUI

# 大阪・関西万博発、
# みんなの新しい暮らし行き。

ついに開幕、大阪・関西万博。
積水化学のフィルム型ペロブスカイト太陽電池が万博会場の西ゲート前にある
第１交通ターミナルのバスシェルターに設置され、夜間LED照明用の電力として活用されます。
薄くて軽くて曲がりやすいから設置場所の選択肢が広がる、次世代の太陽電池。
世界が注目する万博での実証をきっかけに、
皆さんの暮らしの中への実装を推し進めていきます。

フィルム型ペロブスカイト太陽電池

## いまある社会課題を、未来に残さない。

積水化学グループは、
イノベーションによる社会課題解決への貢献を加速させています。
この先もサステナブルな社会の実現に向けて、
LIFEの基盤を支え、"未来につづく安心"を創造していきます。

※広告上の演出です。会場へのペットの同伴は出来ません。

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積水化学工業株式会社

# NEW INSIGHTS INTO MICROSTRUCTURE:

## Dielectric analysis under shear with Rheo-Impedance


**Friction-Free Technology**

**Extended Measurement Range**

**Sensitivity and Versatility**

Rheo-IS

Products

**Poster Session**
**July 21 16:30-18:00**
**[1P29]**
Development of NEW sensor for simultaneous viscosity and impedance measurement
**[1P30]**
Rheo-Impedance in Battery Research: Analysis of Electrode Slurries with Carbon Nanotubes and Battery Performance

**Oral Session**
**July 22 10:30-10:50**
**(RoomD 502)**
Orthogonal Superposition Rheology on the complex fluids with Advanced Rotational Rheometer

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# EMS-1000S

## Electro Magnetically Spinning Viscometer

Scan the QR code for a detailed product description.

(Patent application No.5093599, US 8,365,582 B2, Applicant name: The University of Tokyo)

Breakthrough technology transforming viscosity measurement

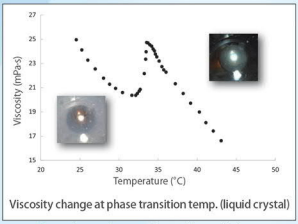
## Speedy results with no compromise to the sample

The key to the EMS-1000S' novel 'non-contact' viscometry technology is the use of electromagnetism to spin a sample-immersed probe in an airtight tube. Viscosity is measured by quantifying the rotational dynamics of the spherical probe spun by the torque resulting from Lorentz interactions between eddy currents and a rotating magnetic field. This viscometer was developed in collaboration with Institute of Industrial Science, the University of Tokyo within the framework of JST Japan Science and Technology Agency.

### Features

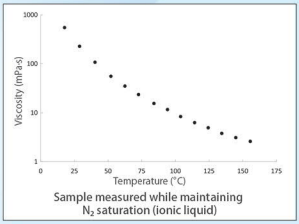
- Wide temperature range (0 to 200℃) and a short measurement time (min. 1 sec.)
- Wide viscosity measurement range (0.1 to 1,000,000 mPa•s).
- Range of additional probe options catering to low viscosity samples, corrosive samples, etc.
- Convenient graphing functions for flow curves and temperature, concentration, and shear rate dependence of viscosity studies.
- Economical, only requiring 300μL of sample (standard tube), or as low as 90μL (optional tube).
- Airtight sample tubes prevent moisture contamination and allow hermetic sealing for maintaining a gaseous atmosphere suitable for your sample (e.g. inert, anaerobic, etc.).

### Applications




Viscosity change at phase transition temp. (liquid crystal)

Sample can be monitored in real-time via a CMOS camera feed.




Sample measured while maintaining $N_2$ saturation (ionic liquid)

Airtight sample tube

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