CIRP2018
68th GENERAL ASSEMBLY
TOKYO, JAPAN
19 to 25 August 2018

PROGRAMME
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</table>
Dear Distinguished CIRP Colleagues,

It is with great pleasure and honour that I welcome you to the 68th CIRP General Assembly in Tokyo, Japan from 19 to 25 August 2018.

The CIRP community provides unequalled opportunities to strengthen relationships among and build an international network of leading researchers and policy makers in production engineering. The new knowledge and understanding that comes from our cooperative activities serves to promote a vibrant society and play a pivotal role in solving the complex problems of our rapidly globalising world.

In the 68th CIRP GA, distinguished international experts will give us excellent lectures to share their experience and knowledge. This exchange of recent research results will promote progress in production engineering throughout the world.

The 68th CIRP GA also offers a Japanese historical and modern cultural programme for accompanying persons. Tokyo, the capital of Japan, is an attractive place for tourists. Therefore, we believe that all participants will enjoy the city life of Tokyo through sightseeing, shopping and tasting Japanese cuisine.

We sincerely hope that you will obtain fruitful results in the 68th CIRP GA, and trust that your stay in Tokyo will be a truly memorable one.

Sincerely yours,

Mamoru MITSUIISHI,
Professor, School of Engineering
Executive Director and Vice President, The University of Tokyo
Chair, the Organising Committee of the 68th CIRP General Assembly
ACKNOWLEDGEMENTS

The Organising Committee wishes to thank the CIRP President and the administration for their contributions to preparing the 68th CIRP General Assembly:

CIRP President: Professor Don Lucca
CIRP Office: Professor Didier Dumur - CIRP Vice President,
            Secretary General Treasurer
            Mrs. Chantal Timar-Schubert - Assistant Secretary General
            Ms. Agnes Chelet - CIRP Accountant

Our gratitude to all Japan Delegation members for their advice and support during the preparation of this event.

Our sincere thanks to all members of the organising committee, the advisory board, the executive committee, and volunteers for their support and advice during the preparation of the 68th CIRP General Assembly.

We also thank our partners for their assistance in the organisation of the 68th CIRP General Assembly.

Science Council of Japan
The Japan Society for Precision Engineering
General Incorporated Association CIRP JAPAN
The world’s leading machine tool manufacturer DMG MORI owns technologies to offer advanced and optimal solutions for customers. As a total solution provider, we holistically provide solutions combining a machine tool with systems and software.

FANUC has pursued factory automation since it succeeded in development of the servo mechanism for the first time in Japanese private company in 1956. FANUC contributes to the factory automation, with the FA Business Division based on basic technologies of CNC and SERVO, the ROBOT Business Division and ROBOMACHINE Business Division applying these basic technologies.
HEIDENHAIN K.K.
https://www.heidenhain.de/de_EN/

HEIDENHAIN has been contributing to the measurement technology for demanding positioning tasks. Our comprehensive product program, including linear and angle encoders, length gages and rotary encoders, offers solutions for all applications in which the highest possible accuracy, reliable reproducibility and repeatability as well as maximum efficiency are required.

NISSAN MOTOR CO., LTD.
https://www.nissan-global.com/EN/

Established in Yokohama City in 1933, Nissan Motor Co., Ltd. currently manufactures vehicles around the world, including Japan. Nissan offers products and services in more than 160 countries and areas worldwide.

OKUMA CORPORATION
https://www.okuma.co.jp/english/

To become the world’s leading “comprehensive monozukuri service” company, Okuma will comprehensively propose various products and services from smart machines that autonomously optimize their machining processes to the establishment of smart factories where production at the entire factory is optimized.

SODICK CO., LTD.
https://www.sodick.co.jp/en/

For over 40 years, Sodick has manufactured superior EDMs to support customers in the production of dies, molds and other various applications, which cannot be produced by standard machining methods.
CIRP COUNCIL 2018

President: Prof. D. Lucca (USA)
Vice President: Prof. D. Dumur (France)
Vice President Elect: Prof. M. Mitsuishi (Japan)
Past President: Prof. Y. Altintas (Canada)
Secretary General Treasurer: Prof. D. Dumur (France)
Technical Secretary: Prof. B. Lauwers (Belgium)
Council Members:
- Prof. T. Aoyama (Japan)
- Prof. A. Balsamo (Italy)
- Prof. A. Bernard (France)
- Prof. C. Evans (USA)
- Prof. S. Kara (Australia)
- Prof. B. Karupschewski (Germany)

STC OFFICERS

<table>
<thead>
<tr>
<th>STC</th>
<th>Chairman</th>
<th>Vice Chairman</th>
<th>Secretary</th>
</tr>
</thead>
<tbody>
<tr>
<td>STC A</td>
<td>J. Sutherland</td>
<td>J. Krueger</td>
<td>Y. Umeda</td>
</tr>
<tr>
<td>STC C</td>
<td>R. M'Saoudi</td>
<td>D. Biermann</td>
<td>S. Melkote</td>
</tr>
<tr>
<td>STC Dn</td>
<td>E. Lutters</td>
<td>R. Stark</td>
<td>T. Tomiyama</td>
</tr>
<tr>
<td>STC E</td>
<td>P. Bartolo</td>
<td>M. Schmidt</td>
<td>F. Pfefferkorn</td>
</tr>
<tr>
<td>STC F</td>
<td>J. Cao</td>
<td>G. Hirt</td>
<td>J. Yanagimoto</td>
</tr>
<tr>
<td>STC G</td>
<td>K. Wegener</td>
<td>H. Yamaguchi</td>
<td>C. Heinzel</td>
</tr>
<tr>
<td>STC M</td>
<td>E. Budak</td>
<td>A. Matsubara</td>
<td>M. Zieh</td>
</tr>
<tr>
<td>STC O</td>
<td>J. Vancza</td>
<td>G. Lanza</td>
<td>T. Tolio</td>
</tr>
<tr>
<td>STC P</td>
<td>W. Gao</td>
<td>A. Donmez</td>
<td>A. Archenti</td>
</tr>
<tr>
<td>STC S</td>
<td>E. Savio</td>
<td>B. Mullany</td>
<td>R. Leach</td>
</tr>
</tbody>
</table>

EDITORIAL COMMITTEE

ORGANISING COMMITTEE

Chair of the Organising Committee
Mamoru Mitsuishi, The University of Tokyo

Vice Chairs of the Organising Committee
Masahiko Mori, DMG MORI CO., LTD.
Hidenori Shinno, Tokyo Institute of Technology

Members of the Organising Committee
Tojiro Aoyama, Keio University
Fumihiko Kimura, The University of Tokyo
Masanori Kunieda, The University of Tokyo
Ken-ichiro Mori, Toyohashi University of Technology
Masayuki Nakao, The University of Tokyo
Eiji Shamoto, Nagoya University
Shozo Takata, Waseda University

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Akira Azushima, Yokohama National University
Ichiro Inasaki, Chubu University
Takahisa Masuzawa, Masuzawa Micromachining Technology Consulting
Naotake Mohri, The University of Tokyo
Toshimichi Moriwaki, Setsunan University
Kozo Osakada, Osaka University
Yoshimi Takeuchi, Chubu University
Hiroyuki Yoshikawa, The Japan Academy
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Yasushi Umeda, The University of Tokyo
Naohiko Sugita, The University of Tokyo
Makoto Fujishima, DMG MORI CO., LTD.
Tatsunori Hara, The University of Tokyo
Kanako Harada, The University of Tokyo
Yasuhiro Kakinuma, Keio University
Kazutoshi Katahira, RIKEN
Hitoshi Komoto, National Institute of Advanced Industrial Science and Technology
Shinsuke Kondo, National Institute of Advanced Industrial Science and Technology
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Keiichi Nakamoto, Tokyo University of Agriculture and Technology
Masayuki Nakao, The University of Tokyo
Nariaki Nishino, The University of Tokyo
Hitoshi Ohmori, RIKEN
Hidenori Shinno, Tokyo Institute of Technology
Satoru Takahashi, The University of Tokyo
Jiwang Yan, Keio University
Jun Yanagimoto, The University of Tokyo
Hayato Yoshioka, Tokyo Institute of Technology
PRACTICAL INFORMATION

Venue
Keio Plaza Hotel Tokyo
2-2-1 Nishi-Shinjuku, Shinjuku-Ku, Tokyo 160-8330, Japan
TEL: +81 3 3344 0111

Venue for Opening Session & Opening Ceremony on Monday, 20 August 2018
Yasuda Auditorium, The University of Tokyo
7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8654, Japan

Date
19 to 25 August 2018

CIRP Secretariat Office
The CIRP Headquarters will be located in "Kaede" on 4F, Keio Plaza Hotel

Registration/Opening Hours
Place: Lobby in front of "Hana" on 4F, Keio Plaza Hotel
Opening hours:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, 19 Aug.</td>
<td>13:00 - 21:00*</td>
</tr>
<tr>
<td>Monday, 20 Aug.</td>
<td>07:30** - 18:00</td>
</tr>
<tr>
<td>Tuesday, 21 Aug.</td>
<td>08:00 - 18:00</td>
</tr>
<tr>
<td>Wednesday, 22 Aug.</td>
<td>08:00 - 18:00</td>
</tr>
<tr>
<td>Thursday, 23 Aug.</td>
<td>08:00 - 18:00</td>
</tr>
<tr>
<td>Friday, 24 Aug.</td>
<td>08:00 - 18:00</td>
</tr>
</tbody>
</table>

*On Sunday, 19 Aug. between 13:00 - 15:30, registration desk will be at the lobby area on 3F.
**On Monday, 20 Aug. between 7:30 - 9:00, registration desk will be at the lobby area on 3F.

Tokyo City Information Desk (Travel Desk)
Participants and accompanying persons are welcome to visit the Tokyo City Information Desk on-site to obtain various information on the city of Tokyo.
Place: Lobby in front of "Hana" on F4, Keio Plaza Hotel
Opening hours:

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sunday, 19 Aug.</td>
<td>15:30 - 20:00*</td>
</tr>
<tr>
<td>Monday, 20 Aug.</td>
<td>13:00 - 18:00</td>
</tr>
<tr>
<td>Tuesday, 21 Aug.</td>
<td>08:00 - 17:00*</td>
</tr>
<tr>
<td>Thursday, 23 Aug.</td>
<td>08:00 - 17:00*</td>
</tr>
</tbody>
</table>

*Opening hours may be subject to change.

Emergency Contact
TEL: +81 3 5381 0375
(Available 19 to 25 Aug. 2018, during Registration opening hours only)

Public Transportation
It takes less than 10 minutes from Keio Plaza Hotel to Shinjuku station, one of the major railway stations in Tokyo serving as a connecting hub. You can easily access other major stations from Shinjuku station, via several train and subway lines. Also, it is very close to Keio Plaza Hotel from Tochomae Station on Toei Oedo Line as well. (Please see the map on p.22.)

Access Routes to Shinjuku Area
Limousine Bus
Airport Limousine Bus goes straight to the major hotels in Shinjuku area from Narita International Airport and Haneda Airport.

<From Narita International Airport>
Duration: approx. 120 minutes
Fare (One-way): Adult JPY 3100 Child JPY 1550
Please visit below for more details:
http://www.limousinebus.co.jp/en/areas/detail/nrt/shinjuku/dep

<From Haneda Airport>
Duration: approx. 70 minutes
Fare (One-way): Adult JPY 1230 (Early Morning/Late Night: JPY 2000)
Child JPY 620 (Early Morning/Late Night: JPY 1000)
Please visit below for more details:
http://www.limousinebus.co.jp/en/areas/detail/hnd/shinjuku/dep
Railways
<From Narita International Airport>
Information regarding railways to central Tokyo area from/to Narita International Airport is available from below:

<From Haneda Airport>
Information regarding railways to central Tokyo area from/to Haneda Airport is available from below:

On-site Registration Fees
Access to all congress activities is subject to registration.
All prices will be processed in Japanese Yen (JPY) and include 8% Tax.

<table>
<thead>
<tr>
<th>Delegate</th>
<th>JPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts I &amp; II</td>
<td>155000</td>
</tr>
<tr>
<td>Part I Only</td>
<td>125000</td>
</tr>
<tr>
<td>Part II Only</td>
<td>120000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dinner ticket (available till sold out)</th>
<th>JPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly Dinner</td>
<td>25000</td>
</tr>
<tr>
<td>Farewell Dinner</td>
<td>18000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Accompanying Person</th>
<th>JPY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts I &amp; II</td>
<td>105000</td>
</tr>
<tr>
<td>Part I Only</td>
<td>80000</td>
</tr>
<tr>
<td>Part II Only</td>
<td>70000</td>
</tr>
</tbody>
</table>

Changes between Delegate and Accompanying persons’ programmes are not allowed.
Payments can be made in cash (Japanese Yen) and by credit card.
Accepted credit cards: VISA, MasterCard, JCB and American Express

Items Included in the Fees

Delegate Parts I & II
Attendance at all sessions from Monday, 20 August to Saturday, 25* August
*Meetings on Saturday, 25 August are open to designated delegates only.
Conference bag/List of participants/Programme booklet
Lunches/Coffee Breaks
Welcome Reception on Sunday, 19 August
Assembly Dinner on Wednesday, 22 August
Farewell Dinner on Saturday, 25 August
Delegate Part I only
Attendance at all sessions from Monday, 20 August to Wednesday, 22 August
Conference bag/List of participants/Programme booklet
Lunches/Coffee Breaks from Monday, 20 August to Wednesday, 22 August
Welcome Reception on Sunday, 19 August
Assembly Dinner on Wednesday, 22 August

Delegate Part II only
Attendance at all sessions from Thursday, 23 August to Saturday, 25* August
*Meetings on Saturday, 25 August are open to designated delegates only.
Conference bag/List of participants/Programme booklet
Lunches/Coffee Breaks from Thursday, 23 August to Saturday, 25 August
Farewell Dinner on Saturday, 25 August

Accompanying Person Parts I & II
Attendance at the Opening Session and Opening Ceremony on Monday, 20 August
Participation in the sightseeing tours (Accompanying Persons’ Programme)
Lunches from Monday, 20 August to Saturday, 25 August
Accompanying Person bag and materials
Welcome Reception on Sunday, 19 August
Assembly Dinner on Wednesday, 22 August
Farewell Dinner on Saturday, 25 August

Accompanying Person Part I only
Attendance at the Opening Session and Opening Ceremony on Monday, 20 August
Participation in the sightseeing tours (Accompanying Persons’ Programme) from
Monday, 20 August to Wednesday, 22 August
Lunches from Monday, 20 August to Wednesday, 22 August
Accompanying Person bag and materials
Welcome Reception on Sunday, 19 August
Assembly Dinner on Wednesday, 22 August

Accompanying Person Part II only
Participation in the sightseeing tours (Accompanying Persons’ Programme) from
Thursday, 23 August to Friday, 24 August
Lunches from Thursday, 23 August to Saturday, 25 August
Accompanying Person bag and materials
Farewell Dinner on Saturday, 25 August

Registration fees do not include:
Flights and transfers between the airport and accommodation.
### Badges/Background Colours

The badge colours indicate the attendee type and the programme chosen.

- **Delegate for Parts I & II**: Light Blue
- **Delegate for Part I only**: Half Light Blue, Half White
- **Delegate for Part II only**: Half White, Half Light Blue
- **Accompanying Person for Parts I & II**: Orange
- **Accompanying Person for Part I only**: Half Orange, Half White
- **Accompanying Person for Part II only**: Half White, Half Orange
- **Organising Committee**: Bordeaux
- **VIP, Dinner tickets**: Light Green
- **Security**: Yellow

Registration documents and badges are issued at the registration desk in the venue. For security and regulatory purposes, badges must be worn at all times inside the venue and during all the CIRP2018 events including social events and accompanying persons’ programmes.

### Lunches

Lunches for the conference delegates will be served on 43F and some rooms on 42F of the Keio Plaza Hotel.

### Coffee Breaks

Coffee for the conference delegates will be served in front of "Hana" and "Nishiki" during coffee breaks.

### PC Room (Speakers’ Room)

Computers and a printer are available for all delegates at "Keyaki" on 4F.

### Speakers’ Presentations

Speakers are requested to bring their presentation data on a USB to the PC Room no later than 30 min. before their session starts. It will be uploaded directly to the correct conference room. The screen size is 16:9.

Technical assistance will be provided in the conference rooms.

**IMPORTANT:** The projector connector is HDMI cable. If you would like to use your own laptop with a different connector, please bring your own adaptor to HDMI.

### Internet Access

- **SSID:** CIRP2018
- **Password:** tokyo2018
VENUE MAP

Keio Plaza Hotel

3F / Lobby Floor

* On Sunday, 19 Aug. between 13:00 - 17:00 and on Monday, 20 Aug. between 7:30 - 9:00 only. Main Registration Desk is on 4F.
## Room Allocation

### PART I

<table>
<thead>
<tr>
<th>Floor</th>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4F</td>
<td>Nishiki</td>
<td>Session Room / Presentation of 69th General Assembly in Birmingham</td>
</tr>
<tr>
<td></td>
<td>Hana A-D</td>
<td>Session Rooms / Welcome Reception</td>
</tr>
<tr>
<td></td>
<td>Kaede</td>
<td>Office of President and CIRP Secretary</td>
</tr>
<tr>
<td></td>
<td>Keyaki</td>
<td>PC Room</td>
</tr>
<tr>
<td></td>
<td>Mizuki</td>
<td>CIRP2018 Secretariat</td>
</tr>
<tr>
<td>5F</td>
<td>Eminence</td>
<td>Keynote</td>
</tr>
<tr>
<td></td>
<td>Concord</td>
<td>-</td>
</tr>
<tr>
<td>42F</td>
<td>Mitake</td>
<td>Board Meeting / Membership Committee / Council Meeting / Senate Meeting</td>
</tr>
<tr>
<td></td>
<td>Takao</td>
<td>Research Affiliate Meeting / Corporate Members Lunch</td>
</tr>
<tr>
<td></td>
<td>Fuji</td>
<td>Corporate Lunch</td>
</tr>
<tr>
<td></td>
<td></td>
<td>*Some rooms on 42F may be used for lunch.</td>
</tr>
<tr>
<td>43F</td>
<td>All Rooms</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

### PART II

<table>
<thead>
<tr>
<th>Floor</th>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4F</td>
<td>Nishiki</td>
<td>STCs / General Meeting</td>
</tr>
<tr>
<td></td>
<td>Hana A-D</td>
<td>STCs / Terminology Committee / Self-Optimizing Machining Systems CWG / Urban Factories Production in Cities CWG / Additive Manufacturing CWG / Communication Committee / Cross STC Meeting</td>
</tr>
<tr>
<td></td>
<td>Kaede</td>
<td>Office of President and CIRP Secretary</td>
</tr>
<tr>
<td></td>
<td>Keyaki</td>
<td>PC Room</td>
</tr>
<tr>
<td></td>
<td>Mizuki</td>
<td>CIRP2018 Secretariat</td>
</tr>
<tr>
<td>5F</td>
<td>Eminence</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Concord</td>
<td>Farewell Dinner</td>
</tr>
<tr>
<td>42F</td>
<td>Mitake</td>
<td>Council Meeting</td>
</tr>
<tr>
<td></td>
<td>Takao</td>
<td>Research Affiliate Meeting</td>
</tr>
<tr>
<td></td>
<td>Fuji</td>
<td>Liaison Committee Meeting</td>
</tr>
<tr>
<td>43F</td>
<td>All Rooms</td>
<td>Lunch</td>
</tr>
</tbody>
</table>
GENERAL INFORMATION

Emergency Calls

<table>
<thead>
<tr>
<th>To Where</th>
<th>Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Police</td>
<td>110</td>
</tr>
<tr>
<td>Ambulance or Fire</td>
<td>119</td>
</tr>
</tbody>
</table>

Security
Japan is known for its low crime rate, but it is always wise to be careful of one’s personal belongings, especially in crowded areas.

Drinking Water – Tap Water
Tap water is safe to drink anywhere in Japan unless mentioned otherwise. Also, you can buy mineral water at convenience stores, supermarkets, and station kiosks, etc.

Currency Exchange
The official currency of Japan is the YEN (¥) and only the Yen is accepted when paying in cash. Currency exchange is available at hotels and designated foreign exchange banks.

Note: A currency exchange machine, for cash only, is located in the lobby on 3F of the Keio Plaza Hotel Tokyo, for your convenience. Exchange is available between the Yen and these currencies:
- US dollar, U.K. pound, Canadian dollar, Australian dollar, Swiss franc, Euro, Singapore dollar, Hong Kong dollar, Chinese yuan, Taiwan dollar, Korean won, Thai baht

Credit Cards, Debit Cards, Traveller’s Cheques and ATMs
Major credit cards such as VISA, MasterCard, Diners Club and American Express are widely accepted in Japan. Personal checks are not accepted anywhere in Japan. Foreign debit cards are not accepted in most Japanese shops or restaurants. Traveller’s cheques are accepted only at limited, designated leading foreign exchange banks and certain currency exchange shops.

ATMs that accept credit, debit and ATM cards issued outside of Japan can be found in:
- 7-Eleven convenience stores: [https://www.sevenbank.co.jp/intlcard/index2.html](https://www.sevenbank.co.jp/intlcard/index2.html)

Please note that ATMs in most Japanese banks do not accept foreign cards that are issued outside of Japan.
Climate
The average temperatures in Tokyo during the period of the conference would generally be as follows:

<table>
<thead>
<tr>
<th></th>
<th>Celsius</th>
<th>Fahrenheit</th>
<th>Humidity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average  High</td>
<td>31.8</td>
<td>89.2</td>
<td>-</td>
</tr>
<tr>
<td>Average  Low</td>
<td>24.1</td>
<td>75.2</td>
<td>61.5</td>
</tr>
<tr>
<td>Average</td>
<td>27.4</td>
<td>81.4</td>
<td>82.5</td>
</tr>
</tbody>
</table>

You can check the latest weather forecast on the Japan Meteorological Agency website.
http://www.jma.go.jp/jma/indexe.html

Electricity
The local power supply is uniformly 100 volts. The frequency is 50Hz in Tokyo (Eastern Japan). The type of power outlet/connector is "Type A" which is a two parallel-pronged type.

Consumption Tax
Consumption tax is 8%.

Taxis
Taxi fares start at approximately JPY410 with additional costs depending on distance covered and time elapsed. Payment is made when you reach your destination and the exact fare is shown clearly on the meter, for transparency and assurance. Tipping is not necessary at any time when taking a taxi.

Tipping
Tipping is not necessary in Japan.

Smoking
Smoking is available only in the designated areas. Public transportation such as trains, buses and taxis are generally non-smoking. Most hotels have separated rooms, smoking or non-smoking.

Unit of Measurement
Metric (kg, g, l, m, km, cm, etc.)

Liability
The Organising Committees and/or Conference Organisers will not be held liable for personal accidents or losses or damage to private property of registered delegates to the Conference. Delegates should make their own arrangements as regards personal insurances.
MAP OF SHINJUKU AREA

- Nishi-Shinjuku
- Marunouchi Line
- Shinjuku 3 chome
- Tokyo Tocho
  (Tokyo Metropolitan Government Building)
- Shinjuku Chuo Koen
- Oedo Line Tochomae
- Shinjuku Station
- JR Shinjuku
- Shinjuku Gyoen
- Hyatt Regency Tokyo
- Oedo Line Tochomae
- Shinjuku Washington Hotel
- JR Kyushu Hotel Blossom Shinjuku
- Keio Plaza Hotel (Conference Venue)
# CIRP2018 GENERAL ASSEMBLY - PROGRAMME PART I

<table>
<thead>
<tr>
<th>Room</th>
<th>Mitake/Takao</th>
<th>Nishiki</th>
<th>Hana A</th>
<th>Hana B</th>
<th>Hana C</th>
<th>Hana D</th>
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*For more details, see p.26-27.*
### CIRP2018 GENERAL ASSEMBLY - PROGRAMME PART II

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<td>08:30-10:00</td>
<td>STC Dn (Terminology Committee)</td>
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<td>Urban Factories Production in Cities CWG</td>
<td>Additive Manufacturing CWG</td>
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<td>16:00-16:30</td>
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<tr>
<td>16:30-18:00</td>
<td>Cross STC Meeting (for members only) [Nishiki]</td>
<td>STC M</td>
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OPENING SESSION AND OPENING CEREMONY PROGRAMME

Monday, 20 August 2018 09:00 - 12:00  
Yasuda Auditorium, The University of Tokyo

**Opening Session (09:00 - 11:10)**

**Opening Address**
68th CIRP General Assembly Chairman of the Organising Committee and CIRP Vice President Elect, Professor Mamoru Mitsuishi (Executive Director and Vice President, The University of Tokyo)

**Opening Address and Lecture**
CIRP President Professor Don Lucca (Oklahoma State University)

**Special Lecture 1: Super-Kamiokande: The Detector and the Discovery of Neutrino Oscillations**
Special University Professor and Distinguished Professor Takaaki Kajita (Nobel Prize Laureate, Director of Institute for Cosmic Ray Research, The University of Tokyo)

**Special Lecture 2: Perspective on Realistic Automotive Technology for Electric Vehicle and Autonomous Driving - What’s Real Automotive Technology for the Future?**
Mr. Hideyuki Sakamoto (Director, Executive Vice President, Nissan Motor Co., Ltd.)

**Taylor Medal Award Ceremony**
CIRP President Professor Don Lucca

Break (Accompanying persons leave to cafeteria)

**Cross STC Keynote 1**
**Composite Materials Parts Manufacturing**
J. Fleischer (1), Roberto Teti (1), Gisela Lanza (2), Paul Tarisai Mativenga (2), Hans-Christian Moehring (2), Alessandra Caggiano

Coffee Break
Opening Ceremony (11:10 - 12:00)
Performance of Japanese Court Music

Welcome Address
Professor Mamoru Mitsuishi

Organiser’s Address
Dr. Atsushi Ieki (President, the Japan Society for Precision Engineering)

Organiser’s Address
Dr. Juichi Yamagiwa (President, Science Council of Japan and President, Kyoto University)

Welcome Address
Professor Don Lucca

Congratulatory Address by Guest of Honour
Mr. Jiro Akama (State Minister of Cabinet Office)

Congratulatory Address by Guest of Honour
Dr. Makoto Gonokami (President, The University of Tokyo)

Presentation of Message from the Prime Minister

Closing Remarks
Neutrinos are one of the most fundamental particles. They have been assumed to have no mass. It was predicted that, if they have masses, they could change their type while they propagate. The phenomena are called neutrino oscillations. Neutrino oscillations were discovered by the Super-Kamiokande experiment by studying neutrinos produced by cosmic ray interactions in the atmosphere. I will describe the Super-Kamiokande detector and the discovery of neutrino oscillations.

Profile
Takaaki Kajita is the Special University Professor at the University of Tokyo, and also the Director of the Institute for Cosmic Ray Research (ICRR) of the University of Tokyo. Kajita received his Ph.D. from the University of Tokyo, School of Science in 1986, and has been researching at Kamiokande and Super-Kamiokande detectors at the Kamioka Observatory in central Japan. In 1998, at the Neutrino International Conference held in Takayama, Gifu, he showed the analysis results which provided strong evidence for atmospheric neutrino oscillations. In 2015 he shared the Nobel Prize in Physics for his role in discovering atmospheric neutrino oscillations. Currently, he is also the project leader for KAGRA Project, aiming to explore the gravitational wave astronomy.
SPECIAL LECTURE 2

Perspective on Realistic Automotive Technology for Electric Vehicle and Autonomous Driving - What’s Real Automotive Technology for the Future?

Hideyuki Sakamoto
Director, Executive Vice President, Nissan Motor Co., Ltd.
President of JSAE (The Society of Automotive Engineers of Japan, Inc.)
Director of JAMA (The Japan Automobile Manufacturers Association, Inc.)

In 2017, Nissan introduced the 2nd generation "Nissan LEAF" with enhancement of every performance aspect such as sufficient cruising range, building on its experience with the world’s first mass-produced battery electric vehicle (EV) "Nissan LEAF", launched in 2010 as a showcase of Nissan’s EV leadership based on its zero emission strategy. EV can be regarded as high performance vehicle since its broad and precise controllability contributes to excellent driving feeling of "Smoothness, Quick G response, and Quietness". Based on Nissan’s experience, this lecture will present technical perspectives on realistic EV technology such as battery evolution, vehicle attitude (orientation) control as well as vehicle safety performance. As a representative example of vehicle intelligence technology, Autonomous Driving (AD) is a breakthrough which provides a distinctive character to an automobile in conjunction with vehicle electrification technology. Nissan already introduced its 1st generation AD vehicle in 2016 for single-lane driving on the highway, and has sold more than 120K unit with positive customer feedback. Nissan is committed to expanding AD technology to multiple-lane driving, and then subsequently to city driving with occasional intervention by the driver. To share the current progress of Nissan’s technology development, a movie will also be demonstrated to show a test drive conducted on a public road under administered conditions. Finally, the lecture will also discuss the latest status and future requirements in engineering development to enable an accelerated shift to EV in the society and application of AD technology to the real world, while providing an engineering point of view on several challenges facing the automotive industry.

Profile
Hideyuki Sakamoto serves as Executive Vice President of Nissan Motor Co., Ltd. (NML) in charge of Manufacturing & SCM Operations. He has held this position
since January 2018. He joined NML in 1980. In April 2003, he transferred to Renault do Brazil S.A. and then to the Nissan Technical Center in North America. Throughout his tenure at NML, He has served mainly in R&D area with a number of roles including Chief Vehicle Engineer of compact vehicle development, Corporate Vice President in charge of development and introduction of Common Module Family, Senior Vice President of Production Engineering and R&D Executive Vice President. He is also appointed to official positions such as Director of JAMA (The Japan Automobile Manufacturers Association, Inc.), President of JSAE (The Society of Automotive Engineers of Japan, Inc.), Chairman of JIIE (The Japan Institute of Industrial Engineering), and Chief Director of JARI (Japan Automobile Research Institute). He graduated from the Faculty of Engineering, Tokyo Institute of Technology.
PUBLIC KEYNOTE PAPERS

Monday, 20 August 2018
Room: Eminence Hall, 5F

14:30 Cross STC Keynote 2
Bio-Inspired Textures for Functional Applications
Ajay P. Malshe (1), Salil Bapat, K.P. Rajurkar (1), H. Haitjema (2)

15:00 Keynote STC - O
Value Creation in Production: Reconsideration from Interdisciplinary Approaches
Toshiya Kaihara (2), Nariaki Nishino (2), Kanji Ueda† (1),
Mitchell Tseng (1), Jozsef Vancza (1), Paul Schoensleben (2),
Roberto Teti (1), Takeshi Takenaka

15:30 Keynote STC - E
Advances in Macro-Scale Laser Processing
Michael Schmidt (2), Michael Zaeh (2), Lin Li (1), Joost Duflou (1),
Ludger Overmeyer (2), Frank Vollertsen (1)

Authors
(1) Fellows
(2) Associate Members
(3) Corporate Members
SESSION PROGRAMME

SESSION on Life-Cycle Engineering and Assembly (A)

Wednesday, 22 August 2018 08:00 - 12:00
Room: Hana B, 4F

08:00 A1- Process Design and Modelling Methods for Automated Handling and Draping Strategies for Composite Components
Christopher Bruns, Moritz Micke-Camuz, Florian Bohne, Annika Raatz / H.-P. Wiendahl (1)

08:30 A2- A Highly Efficient Hybrid Inductive Joining Technology for Metals and Composite
Verena Kraeusel, Alexander Froehlich, Martin Kroll, Patrick Rochala, Jonas Kimme, Rafael Wertheim (1)

09:00 A3- Trend-Specific Clustering for Micro Mass Production of Linked Parts
Kirsten Tracht (2), Ann-Kathrin Onken, Phil Gralla, Joel Haji Emad, Niklas Kipry, Peter Maass

09:30 A4- Brainwaves Driven Human-Robot Collaborative Assembly
Abdullah Mohammed, Lihui Wang (1)

10:30 Keynote A- Life Cycle Engineering of Lightweight Structures
Christoph Herrmann (2), Wim Dewulf (2), Michael Hauschild (1), Alexander Kaluza, Sami Kara (1), Steve Skerlos

11:00 A5- Deep Learning-Based Human Motion Recognition for Predictive Context-Aware Human-Robot Collaboration
Peng Wang, Hongyi Liu, Lihui Wang (1), Robert X. Gao (1)

11:30 A6- Role of Manufacturing towards Achieving Circular Economy: the Steel Case
Peng Wang, Sami Kara (1), Michael Hauschild (1)
Wednesday, 22 August 2018
Room: Hana B, 4F

13:30
A7- Integrated Computational Life Cycle Engineering - Application to the Case of Electric Vehicles
Felipe Cerdas, Sebastian Thiede, Christoph Herrmann (2)

14:00
A8- Demanufacturing Photovoltaic Panels: Comparison of End-of-Life Treatment Strategies for Improved Resource Recovery
Joost R. Duflou (1), Jef R. Peeters, Diego Altamirano, Ellen Bracquene, Wim Dewulf (2)

14:30
Aydin Nassehi (2), Marcello Colledani (2)

15:00
A10- A Location-Allocation Model for Sustainable NdFeB Magnet Recovery under Uncertainties
Hongyue Jin, Byung Duk Song, Gamini Mendis, Yuehwern Yih, John W. Sutherland (1)
SESSION on Cutting (C)

Monday, 20 August 2018 16:30 - 18:00
Room: Nishiki, 4F

16:30  Keynote C- Deep Hole Drilling
D. Biermann (1), F. Bleicher (2), U. Heisel (1), F. Klocke (1),
H.C. Moehring (2), A. Shih (2)

17:00  C1- A Novel Approach for Real-Time Prediction and Prevention of
Tool Chipping in Intermittent Turning Machining
Mahmoud Hassan, Ahmad Sadek, Ahmed Damir, Helmi Attia (1),
Vincent Thomson

17:30  C2- Performance of a New Piezoceramic Thick Film Sensor for
Measurement and Control of Cutting Forces during Milling
Welf-Guntram Drossel (2), Sylvia Gebhardt, André Bucht,
Burkhard Kranz, Jörg Schneider, Martin Ettrichrätz

Tuesday, 21 August 2018 08:00 - 12:00
Room: Nishiki, 4F

08:00  C3- Stability Analysis of Modulated Tool Path Turning
Ryan Copenhaver, Tony Schmitz, Scott Smith (1)

08:30  C4- Cutting Force Model for Gear Honing
Thomas Bergs / F. Klocke (1)

09:00  C5- A Hybrid Approach to Integrate Machine Learning and Process
Mechanics for the Prediction of Specific Cutting Energy
Ziye Liu, Y.B. Guo (2)

09:30  C6- Temperature Calculation in Cutting Zones
Hans-Christian Moehring (2), Valerii Kushner, Michael Storchak,
Thomas Stehle
<table>
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<tr>
<th>Time</th>
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<th>Title</th>
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<tr>
<td>10:30</td>
<td>C7</td>
<td>Towards a New Tribological Approach to Predict Cutting Tool Wear</td>
<td>Joel Rech, Axel Giovenco, Cedric Courbon, Frederic Cabanettes / K. Bouzakis (1)</td>
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<td>11:00</td>
<td>C8</td>
<td>Novel Drill Bit with Characteristic Web Shape for High Efficiency and Accuracy</td>
<td>Naohiko Sugita (2), Masaya Oshima, Katsuyo Kimura, Giichi Arai, Koichi Arai</td>
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<td>Basic Principles for the Design of Cutting Edge Roundings</td>
<td>Benjamin Bergmann, Thilo Grove / K. Weinert (1)</td>
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**Tuesday, 21 August 2018**  
**Room: Nishiki, 4F**

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<td>Influence of Oxygen on the Tool Wear in Machining</td>
<td>Volodymyr Bushlya, Filip Lenrick, Jan-Eric Stahl, Rachid M’Saoubi (1)</td>
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<td>Cutting Characteristics of PVD-Coated Tools Deposited by Filtered arc Deposition (FAD) Method</td>
<td>Akira Hosokawa, Goushi Hoshino, Tomohiro Koyano, Takashi Ueda (1)</td>
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<td>Bias Voltage Optimum Adjustment Considering Coatings’ Strength and Adhesion Requirements When Cutting Various Steels</td>
<td>Georgios Skordaris (2), Konstantinos-Dionysios Bouzakis (1), Tilemachos Kotsanis, Paschalis Charalampous, Emmanouil Bouzakis, Roland Bejjani</td>
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<td>Thermomechanical Analysis Induced by Interrupted Cutting of Ti6Al4V under Several Cooling Strategies</td>
<td>Pierre Lequien, Gerard Poulachon (1), Jose Outeiro (2)</td>
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<tr>
<td>16:00</td>
<td>C14</td>
<td>Sub-Zero Cooling: a Novel Strategy for High Performance Cutting</td>
<td>Benjamin Kirsch, Stephan Basten, Hans Hasse, Jan Christian Aurich (1)</td>
</tr>
<tr>
<td>16:30</td>
<td>C15</td>
<td>Fatigue Life of Machined Ti6Al4V Alloy under Different Cooling Conditions</td>
<td>Domenico Umbrello (2), Giovanna Rotella</td>
</tr>
<tr>
<td>17:00</td>
<td>C16</td>
<td>The Influence of Burr Formation and Feed Rate on the Fatigue Life of Drilled Titanium and Aluminium Alloys Used in Aircraft Manufacture</td>
<td>Ali M. Abdelhafeez, Sein Leung Soo (1), David K. Aspinwall (1), Anthony Dowson, Dick Arnold</td>
</tr>
<tr>
<td>17:30</td>
<td>C17</td>
<td>On the Influence of Gamma Prime upon Machining of Advanced Nickel Based Superalloy</td>
<td>Zhirong Liao, Dragos Axinte (1), Maxime Mieszala, Rachid M’Saoubi (1), Johann Michler, Mark Hardy</td>
</tr>
<tr>
<td>18:00</td>
<td>C18</td>
<td>A Novel Work Holding Method for Hard Turning Using Shoe-Centerless Concept</td>
<td>Rahul Chaudhari (3), Fukuo Hashimoto (1)</td>
</tr>
</tbody>
</table>
Wednesday, 22 August 2018
Room: Hana C, 4F

08:00 - 10:00

08:00  C19- Development of a Directly-Driven Thread Whirling Unit with Advanced Tool Materials for Mass-production of Implantable Medical Parts
Masakazu Soshi, Franco Rigolone, Jennifer Sheffield, Kazuo Yamazaki (1)

08:30  C20- High-Efficiency Swinging-Rotating Diamond Shaping of Fresnel Lenses on Roller Molds
XinQuan Zhang, Rui Huang, A. Senthil Kumar, Kui Liu / E. Brinksmeier (1)

09:00  C21- Study of Stress Intensity Factor on the Anisotropic Machining Behavior of Single Crystal Sapphire
Hae-Sung Yoon, Suk Bum Kwon, Aditya Nagaraj, Seola Lee, Sangkee Min (2)

09:30  C22- Modelling of the Combined Microstructural and Cutting Edge Effects in Ultraprecision Machining
Mustafizur Rahman (1), Keng Soon Woon, V.C. Venkatesh (1), M.A. Rahman
SESSION on Design (Dn)

Monday, 20 August 2018  16:30 - 18:00
Room: Hana A, 4F

16:30  Dn1- Model-Based Design and Simulation of Smart Factory From Usage and Functional Aspects
       Hitoshi Komoto (2), Keijiro Masui

17:00  Dn2- Enhancing Development Trajectories of Synthetic Environments
       Roy Damgrave, Eric Lutters (1)

17:30  Dn3- Workplace Analysis and Design Using Virtual Reality Techniques
       George Michalos, Anna Karvouniari, Nikolaos Dimitropoulos,
       Theodoros Togias, Sotiris Makris (2)

Tuesday, 21 August 2018  08:30 - 12:00
Room: Hana A, 4F

08:30  Dn4- Mapping Customer Needs to Design Parameters in the Front End of Product Design by Applying Deep Learning
       Yue Wang, Daniel Y. Mo, Mitchell Tseng (1)

09:00  Dn5- Product Features Characterization and Customers' Preferences Prediction Based on Purchasing Data
       Jian Zhang, Alessandro Simeone, Peihua Gu (1), Bo Hong

09:30  Dn6- Smart Pressure Distribution Estimation in Biological Joints for Mechanical Bio-Inspired Design
       Elia Picault, Emmanuel Mermoz (2), Thomas Thouveny,
       Jean-Marc Linares (1)
<table>
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<tr>
<th>Time</th>
<th>Session</th>
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</table>
| 10:30  | **Keynote Dn- Tolerancing: Managing Uncertainty from Conceptual Design to Final Product**  
        | Edward Morse (3), Jean-Yves Dantan (2), Nabil Anwer (2), Rikard Söderberg (2), Giovanni Moroni (2), Ahmed Qureshi, Xiangqian Jiang (1), Luc Mathieu (1) |
| 11:00  | **Dn7- Machine Learning in Tolerancing for Additive Manufacturing**  
        | Zuowei Zhu, Nabil Anwer (2), Qiang Huang, Luc Mathieu (1) |
| 11:30  | **Dn8- Resilient Architecture for Cyber-Physical Production Systems**  
        | Tetsuo Tomiyama (1), Florian Moyen |

**Tuesday, 21 August 2018**  
Room: Hana A, 4F  
13:30 - 15:30

<table>
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<tr>
<th>Time</th>
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</table>
| 13:30  | **Dn9- An Information and Simulation Framework for Increased Quality in Welded Components**  
        | Rikard Söderberg (2), Kristina Wärmejord, Julia Madrid, Samuel Lorin, Anders Forslund, Lars Lindkvist |
| 14:00  | **Dn10- Digital Twin Driven Prognostics and Health Management for Complex Equipment**  
        | Fei Tao, Meng Zhang, Yushan Liu, A.Y.C. Nee (1) |
| 14:30  | **Dn11- An Architectural Approach to the Integration of Safety and Security Requirements in Smart Products and Systems Design**  
        | Andreas Erik Riel (2), Christian Kreiner, Richard Messnarz, Alexander Much |
| 15:00  | **Dn12- Novel Design Approach for the Creation of 3D Geometrical Model of Personalized Bone Scaffold**  
        | Nikola Vitkovic, Milos Stojkovic, Vidosav Majstorovic (1), Miroslav D. Trajanovic, Jelena Milovanovic |
**SESSION on Electro-Physical & Chemical Processes (E)**

**Monday, 20 August 2018**

16:30 - 18:00

Room: Hana C, 4F

16:30  E1- Nanoscale Surface Patterning of Diamond Utilizing Carbon Diffusion Reaction with a Microstructured Titanium Mold
Jiwang Yan (2), Yuji Imoto

17:00  E2- Direct Manufacturing of Diamond Composite Coatings onto Silicon Wafers and Heat Transfer Performance
Rocco Lupoi, Tomas Lupton, Richard Jenkins, Anthony Robinson, Garret O’Donnell (2)

17:30  E3- Modeling Study of the Hydrodynamic Arc Breaking Mechanism in BEAM
Wansheng Zhao, Lin Gu, Fawang Zhang, K.P. Rajurkar (1)

**Tuesday, 21 August 2018**

08:00 - 12:00

Room: Hana C, 4F

08:00  E4- Direct Laser Assisted Machining with a Sapphire Tool for Bulk Metallic Glass
Simon Park (2), Yuan Wei, Xiaoliang Jin

08:30  E5- Efficient and Damage-Free Ultrashort Pulsed Laser Cutting of Polymer Intraocular Lens Implants
Johannes Heberle, Tom Häfner, Michael Schmidt (2)

09:00  E6- Mechanisms and Processing Limits of Surface Finish Using Laser-Thermochemical Polishing
Sandro Eckert, Frank Vollertsen (1)

09:30  E7- Precision Enhanced Electrochemical Jet Processing
Adam Thomas Clare, Alistair Speidel, Ivan Bisterov, Alexander Jackson-Crisp, Jonathon Mitchell-Smith / D. Williams (1)
10:30 E8- Efficient Machining of Complex Shaped Seal Slots for Turbomachinery
Umang Maradia, Mikhail Kliuev, Christoph Baumgart / B. Schumacher (1)

11:00 E9- Attempts to Fabricate Micro Injection Molding Tools and Assemble Molded Micro Parts on Same EDM Machine
Kazuki Oshima, Masanori Kunieda (1)

11:30 E10- Experimental Investigation of the Process Behaviour in Mechano-Electrochemical Milling
Dries Van Camp, Jun Qian, Jef Vleugels, Bert Lauwers (1)

Tuesday, 21 August 2018 13:30 - 18:30
Room: Hana C, 4F

13:30 E11- Anomalous Influence of Polarity in Sink EDM of Titanium Alloys
Maximilian Holsten, Philip Koshy (1), Andreas Klink (2), Alexander Schwedt

14:00 E12- Additive Manufacturing of Metal Components with the ARBURG Plastic Freeforming Process
Quirin Spiller, Juergen Fleischer (1)

14:30 E13- A Plasma-Assisted Bio-Extrusion System for Tissue Engineering
F. Liu, W. Wang, W. Mirihanage, Srichand Hinduja (1), Paulo J. Bartolo (1)

15:00 E14- Effects of Cladding Path on Workpiece Geometry and Impact Toughness in Directed Energy Deposition of 316L Stainless Steel
Daisuke Kono, Akihiro Maruhashi, Iwao Yamaji, Yohei Oda, Masahiko Mori (1)
16:00  E15- Controlling Metal Structure with Remelting Process in Direct Energy Deposition of Inconel 625
       Ryo Koike, Taro Misawa, Tojiro Aoyama (1), Masaki Kondo

16:30  E16- Study of an Annular Laser Beam Based Axially-Fed Powder Cladding Process
       Edvard Govekar (1), Andrej Jeromen, Alexander Kuznetsov, Gideon Levy (1), Makoto Fujishima (3)

17:00  E17- 3D Printing of Multiple Metallic Materials via Modified Selective Laser Melting
       Chao Wei, Lin Li (1), Xiaoji Zhang, Yuan-Hui Chueh

17:30  E18- A Scalable Predictive Model and Validation for Residual Stress and Distortion in Selective Laser Melting
       Chao Li, Y.B. Guo (2), Xiaoying Fang, Fengzhou Fang (1)

18:00  E19- Experimental Investigation of Melt Pool Behaviour during Selective Laser Melting by High Speed Imaging
       Tatsuaki Furumoto (2), Kyota Egashira, Kenta Munekage, Satoshi Abe
SESSION on Forming (F)

Monday, 20 August 2018 16:30 - 18:00
Room: Hana B, 4F

16:30  
F1- Determination of Friction Law in Metal Forming under Oil-lubricated Condition  
Zhigang Wang, Wenzhong Dong, Kozo Osakada (1)

17:00  
F2- Friction Coefficients in Cold Forging: a Global Perspective  
Peter Groche (1), Philipp Kramer, Niels Bay (1), Peter Christiansen, Laurent Dubar, Kunio Hayakawa, Chengliang Hu, Kazuhiko Kitamura, Philippe Moreau

17:30  
F3- Innovative Measurement Technique to Determine Equibiaxial Flow Curves of Sheet Metals Using a Modified Nakajima Test  
Matthias Eder, Christian Gaber, Winfried Nester, Hartmut Hoffmann (1), Wolfram Volk (2)

Tuesday, 21 August 2018 08:30 - 12:00
Room: Hana B, 4F

08:30  
F4- New Method for Stress Determination Based on Digital Image Correlation Data  
Alexander Brosius, Niklas Küsters, Matthias Lenzen / Manfred Geiger (1)

09:00  
F5- Mechanisms for Controlling Springback and Strength in Heat-Assisted Sheet Forming  
Christian Löbbe, A. Erman Tekkaya (1)

09:30  
F6- Influence of Ultrasonic Vibration on the Shear Formability of Metallic Materials  
Markus Michalski, Michael Lechner, Micha Gruber, Marion Merklein (1)
F7- Investigation on Formability Enhancement of 5A06 Aluminium Sheet by Impact Hydroforming
Yan Ma, Yong Xu, Shi-Hong Zhang, Dorel Banabic (1), Ali A. El-Aty, Da-Yong Chen, Ming Cheng, Hong-Wu Song, Arturu I. Pokrovsky, Guo-Qing Chen

F8- Semi-Analytical Modelling with Numerical and Experimental Validation of Electromagnetic Forming Using a Uniform Pressure Actuator
Brad Lee Kinsey (2), Shunyi Zhang, Yannis P. Korkolis

F9- Electroplastic Effect on AA1050 Aluminium Alloy Formability
Andrea Ghiotti (2), Stefania Bruschi (1), Enrico Simonetto, Claudio Gennari, Irene Calliari, Paolo F. Bariani (1)

Tuesday, 21 August 2018
Room: Hana B, 4F

13:30 - 18:00

Keynote F- Flexibility in Metal Forming

F10- Multi-Station Molding Machine for Attaining High Productivity in Small-Lot Production
Chikage Kato, Naoki Hiraiwa, Tsuyoshi Arai, Jun Yanagimoto (1)

F11- Effectiveness of Electrically Assisted Solid-State Pressure Joining Using an Additive Manufactured Porous Interlayer
Sung-Tae Hong, Yong-Fang Li, Ju-Won Park, Heung Nam Han / Soo Ik Oh (1)

F12- A New Joining by Forming Process to Produce Lap Joints in Metal Sheets
Joao P. Pragana, Carlos M. Silva, Ivo M. Bragança, Luis M. Alves, Paulo A.F. Martins (2)
16:00  F13- An Extrusion Method of Tube with Spiral Inner Fins by Utilizing Generation of Spiral Outer Fins/Grooves
Takashi Kuboki (2), Michiaki Ishikawa, Shohei Kajikawa, Makoto Murata

16:30  F14- Large Reduction Die-Less Mandrel Drawing of Magnesium Alloy Micro-Tubes
Tsuyoshi Furushima, Ken-ichi Manabe / Manabu Kiuchi (1)

17:00  F15- Improving the Thickness Accuracy of Cold Rolled Narrow Strip by Piezoelectric Roll Gap Control at High Rolling Speed
Sven Stockert, Matthias Wehr, Johannes Lohmar, Gerhard Hirt (1), Dirk Abel

17:30  F16- Necking Condition of Layers in Clad Sheets during Rolling
Hiroshi Utsunomiya (2), Soichiro Maeda, Tetsuyuki Imai, Ryo Matsumoto
SESSION on Abrasive Process (G)

Wednesday, 22 August 2018  
Room: Hana C, 4F  
10:30 - 12:00

10:30  G1- Thermal Modeling and Optimization of Interrupted Grinding
Changsheng Guo (2), Yan Chen

11:00  G2- Stochastic Modelling of Grain Wear in Geometric Physically-Based Grinding Simulations
Petra Wiederkehr, Tobias Siebrecht, Nils Potthoff / Dirk Biermann (1)

11:30  G3- Study of the Effects of Laser Micro Structuring on Grinding of Silicon Nitride Ceramics
Bahman Azarhoushang, Babak Soltani, Amir Daneshi / Goverdham D. Lahoti (1)

Wednesday, 22 August 2018  
Room: Hana C, 4F  
13:30 - 18:30

13:30  G4- Surface Layer Modification Charts for Gear Grinding
Stepan Jermolajev, Ekkard Brinksmeier (1), Carsten Heinzel (2)

14:00  G5- Increased Productivity in Centerless Grinding Using Inertial Active Dampers
David Barrenetxea (2), Iker Mancisidor, Xavier Beudaert (3), Jokin Munoa (2)

14:30  G6- Development of a Patterning System for Vitrified CBN Wheels Based on Modal Analysis
Eraldo Jannone da Silva (2), Gustavo P. Marcos, Giuliana S. Venter, Alex C. Bottene, Joao F. Oliveira (1), Caio A. Rodrigues

15:00  G7- Truing of Diamond Wheels - Geometry, Kinematics and Removal Mechanisms
Radovan Drazumeric, Jeffrey Badger (3), Uta Klement, Peter Krajnik (2)
16:00  **Keynote G- Fixed Abrasive Machining of Non-Metallic Materials**
Albert J. Shih (2), Berend Denkena (1), Thilo Grove, David Curry, Hong Hocheng, Hung-Yin Tsai, Hitoshi Ohmori (1), Kazutoshi Katahira (2), Z.J. Pei

16:30  **G8- Nanometer-Scale Characteristics of Polycrystalline YAG Ceramic Polishing**
Daniel Ross, Hitomi Yamaguchi (2)

17:00  **G9- Damage-Free Highly Efficient Polishing of Single-Crystal Diamond Wafer by Plasma-Assisted Polishing**
Kazuya Yamamura (2), Ken Emori, Rongyan Sun, Yuji Ohkubo, Katsuyoshi Endo, Hideaki Yamada, Akiyoshi Chayahara, Yoshiaki Mokuno

17:30  **G10- Curvature-Adaptive Multi-Jet Polishing of Freeform Surfaces**
Benny C.F. Cheung (2), Chunjin Wang, Lai Ting Ho, Jiangbo Chen

18:00  **G11- Process Mechanism in Ultrasonic Cavitation Assisted Fluid Jet Polishing**
Anthony Tadeus Beaucamp (2), Tomoya Katsuura, Kie Takata
SESSION on Machines (M)

Wednesday, 22 August 2018 08:00 - 12:00
Room: Nishiki, 4F

08:00  M1- Virtual Compensation of Deflection Errors in Ball end Milling of Flexible Blades
Yusuf Altintas (1), Oguzhan Tuysuz, Mohsen Habibi, Zhoulong Li

08:30  M2- Adaptive Preloading for Rack-and-Pinion Drive Systems
Alexander Wilhelm Verl (2), Tim Engelberth

09:00  M3- Ultimate Capability of Variable Pitch Milling Cutters
Gabor Stepan (2), David Hajdu, Alex Iglesias, Denes Takacs, Zoltan Dombovari

09:30  M4- Spline Interpolation with Optimal Frequency Spectrum for Vibration Avoidance
Burak Sencer, Alper Dumanli, Yuki Yamada / M.A. Elbestawi (1)

10:30  M5- General Contact Force Control Algorithm in Double-Sided Incremental Forming
Huaqing Ren, Fuhua Li, Newell H. Moser, Dohyun Leem, Tiemin Li, Kornel F. Ehmann, Jian Cao (1)

11:00  M6- Adaptive Inverse Control of a Galvanometer Scanner Considering the Structural Dynamic Behavior
Michael F. Zaeh (2), Sebastian J. Pieczona

11:30  M7- A Novel Cascade Control Principle for Feed Drive of Machine Tools
Zheng Sun, Günter Pritschow (1), Peter Zahn, Armin Lechler

Wednesday, 22 August 2018 13:30 - 18:30
Room: Nishiki, 4F

13:30  M8- Measurement and Analysis of Friction Fluctuations in Linear Guideways
Tetsuya Miura, Atsushi Matsubara (2), Iwao Yamaji, Kaoru Hoshide
14:00  M9- Suppressing Vibration Modes of Spindle-Holder-Tool Assembly through FRF Modification for Enhanced Chatter Stability
Yaser Mohammadi, Milad Azvar, Erhan Budak (1)

14:30  M10- Proposal of 'Accelerative Cutting’ for Suppression of Regenerative Chatter
Takehiro Hayasaka, Soohyun Nam, Hongjin Jung, Eiji Shamoto (1), Katsuhisa Saito

15:00  M11- An Active Non-Contact Journal Bearing with Bi-Directional Driving Capability Utilizing Coupled Resonant Mode
Ping Guo, Han Gao / Ajay P. Malshe (1)

16:00  M12- Modelling of Ball Screw Drives Rolling Element Contact Characteristics
Christian Brecher (1), Bastian Esser, Jens Falker, Florian Kneer, Marcel Fey

16:30  M13- Design of a CFRP-Elastomer Composite with High Stiffness and Damping Capability
Toru Kizaki, Tatsuya Fujii, Masatoshi Iwama, Masaru Shiraishi, Naohiko Sugita (2), Sung-Hoon Ahn (2)

17:00  M14- Influence of Spindle Condition on the Dynamic Behaviour
Mathieu Ritou, Clement Rabreau, Sebastien Le Loch, Benoit Furet, Didier Dumur (1)

17:30  M15- Feeling Machines for Online Detection and Compensation of Tool Deflection in Milling
Berend Denkena (1), Haythem Boujnah

18:00  M16- Robotic Assisted Milling for Increased Productivity
Erdem Ozturk (2), Asier Barrios, Chao Sun, Saeed Rajabi, Jokin Munoa (2)
SESSION on Production Systems and Organizations (O)

Tuesday, 21 August 2018
Room: Hana A, 4F

16:00  O1- Order Allocation and Sequencing with Variable Degree of Uncertainty in Aircraft Manufacturing
Marcello Urgo, Jens Buergin, Tullio Tolio (1), Gisela Lanza (2)

16:30  O2- Real-Time Teaming of Multiple Reconfigurable Manufacturing Systems
Xingyu Li, Alparslan Emrah Bayrak, Bogdan I.I. Epureanu, Yoram Koren (1)

17:00  O3- Towards Joint Optimization of Product Design, Process Planning and Production Planning in Multi-Product Assembly
Daisuke Tsutsumi (3), David Gyulai, Andras Kovacs, Bence Tipary, Yumiko Ueno (3), Youichi Nonaka (3), Laszlo Monostori (1)

17:30  O4- Interdisciplinary Multi-Criteria Optimization Using Hybrid Simulation to Pursue Energy-Efficiency through Production Planning
Wilfried Sihn (1), Thomas Sobottka, Bernhard Heinzl, Felix Kamhuber

18:00  O5- Integrated Simulation-Based Facility Layout and Complex Production Line Design under Uncertainty
Nikolaos Papakostas (2), Joseph O’Connor Moneley, Vincent Hargaden

Wednesday, 22 August 2018
Room: Hana A, 4F

08:00  O6- Adaptive Automation and Human Factors in Manufacturing: an Experimental Assessment for a Cognitive Approach
Doriana Marilena D’Addona (2), Fabrizio Bracco, Andrea Bettoni, Nariaki Nishino (2), Emanuele Carpanzano (1), Alessandro Bruzzone (1)
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<tr>
<td>08:30</td>
<td>O7</td>
<td>Learnstruments: Learning-Conducive Artefacts to Foster Learning Productivity in Production Engineering</td>
<td>Jan P. Menn, Bernd Muschard, Bastian C. Schumacher, Felix Sieckmann, Holger Kohl, Guenther Seliger (1)</td>
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<tr>
<td>09:00</td>
<td>O8</td>
<td>Mixed-Initiative Assembly Planning Combining Geometric Reasoning and Constrained Optimization</td>
<td>Csaba Kardos, Jozsef Vancza (1)</td>
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<tr>
<td>09:30</td>
<td>O9</td>
<td>A KBE CAPP Framework for Qualified Additive Manufacturing</td>
<td>Yicha Zhang, Alain Paul Bernard (1)</td>
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<tr>
<td>10:30</td>
<td>O10</td>
<td>Cost-Oriented Planning of Equipment for Selective Laser Melting (SLM) in Production Lines</td>
<td>Robin Kopf, Jonas Gottwald, Alexander Jacob, Milan Brandt, Gisela Lanza (2)</td>
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<td>11:00</td>
<td>O11</td>
<td>Process-Independent Workstation Layout for Lean Automation</td>
<td>Kenta Shigematsu, Yasuhiko Yamazaki (3), Shigeya Kato, Fumio Kojima, Shozo Takata (1)</td>
</tr>
<tr>
<td>11:30</td>
<td>O12</td>
<td>A Geometrical Model for Managing Surface Productivity of U-Shaped Assembly Lines</td>
<td>Francisco Gil Vilda, Jose Antonio Yague-Fabra (2), Albert Sune Torrents, Juan M. Jauregui Becker, Wessel W. Wits (2)</td>
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Wednesday, 22 August 2018
Room: Hana A, 4F

13:30 | O13     | Machine Learning Approach Based on Fractal Analysis for Optimal Tool Life Exploitation in CFRP Composite Drilling for Aeronautical Assembly | Alessandra Caggiano, Xavier Rimpault, Roberto Teti (1), Marek Balazinski (1), Jean-François Chatelain, Luigi Nele |
14:00  O14- A Standards-Based Approach for Linking As-Planned to As-Fabricated Product Data
Moneer Helu (3), Alex Joseph, Thomas Hedberg / Robert G. Wilhelm (1)

14:30  O15- A Multi-Sensor Approach for Failure Identification during Production Enabled by Parallel Data Monitoring
Matthias Putz (2), Thomas Wiener, Alexander Pierer, Michael Hoffmann

15:00  O16- Planar Random Graph Representations of Spatiotemporal Surface Morphology: Application to Finishing of 3-D Printed Components
Satish T. Bukkapatnam, Ashif S. Iquebal, Soundar Kumara (1)

16:00  O17- Impact of Opportunistic Maintenance on Manufacturing System Performance
Marcello Colledani (2), Maria Chiara Magnanini, Tullio Tolio (1)

16:30  O18- Smart, Simulation-Based Resource Sharing in Federated Production Networks
Botond Kadar (2), Peter Egri, Gianfranco Pedone, Takafumi Chida

17:00  O19- Distributed Control with Rationally Bounded Agents in Cyber-Physical Production Systems
Rok Vrabič, Dominik Kozjek, Andreja Malus, Viktor Zaletelj, Peter Butala (1)

17:30  O20- Reinforcement Learning for Adaptive Order Dispatching in the Semiconductor Industry
Nicole Stricker, Andreas Kuhnle, Roland Sturm, Simon Friess / Hartmut Weule (1)

18:00  O21- Data-Driven Production Control for Complex and Dynamic Manufacturing Systems
Enzo Morosini Frazzon, Mirko Kück Michael Freitag / Berndt Scholz-Reiter (1)
SESSION on Precision Engineering & Metrology (P)

Monday, 20 August 2018 16:30 - 18:00
Room: Hana D, 4F

16:30  P1- Segmentation-Free Geometrical Verification of Additively Manufactured Components by X-Ray Computed Tomography
Giovanni Moroni (2), Stefano Petro

17:00  P2- Enhanced Dimensional Measurement by Fast Determination and Compensation of Geometrical Misalignments of X-Ray Computed Tomography Instruments
Wim Dewulf (2), Massimiliano Ferrucci, Evelina Ametova, Petr Hermanek, Gabriel Probst, Bart Boeckmans, Tom Craeghs, Simone Carmignato (2)

17:30  P3- Model-Based Optimisation of CT Imaging Parameters for Dimensional Measurements on Multimaterial Workpieces
Robert Schmitt (2), Andrea Buratti, Natalia Grozmani, Christoph Voigtmann, Martin Peterek

Tuesday, 21 August 2018 13:30 - 18:30
Room: Hana D, 4F

13:30  P4- Redundancy-Enabled Stabilisation of Linear Encoder Performance: the biSLIDER
Alessandro Balsamo (1), Claudio Francese, Renato Ottone, Aline Piccato

14:00  P5- A Stitching Linear-Scan Method for Roundness Measurement of Small Cylinders
Yuanliu Chen, Yuki Machida, Yuki Shimizu, Hiraku Matsukuma, Wei Gao (1)

14:30  P6- Hierarchical-Information-Based Characterization of Multiscale Structured Surfaces
Benny Chi Fai Cheung (2), Mingyu Liu, Richard Leach (2), Xiaobing Feng, Chenyang Zhao
15:00  P7- High Performance Ultra-Precision Turning of Large-Aspect-Ratio Rectangular Freeform Optics
Xiaodong Zhang (2), Zexiao Li, Guoxiong Zhang (1)

16:00  Keynote P- Modelling and Traceability for Computationally-Intensive Precision Engineering and Metrology
F. Haertig, W. Gao (1)

16:30  P8- Modelling and Compensation of Dominant Thermally Induced Geometric Errors Using Rotary Axes’ Power Consumption
Elie Bitar-Nehme, Rene Mayer (2)

17:00  P9- An Adaptive Self-Learning Compensation Approach for Thermal Errors on 5-Axis Machine Tools Handling an Arbitrary Set of Sample rates
Josef Mayr (2), Philip Blaser, Adrian Ryser, Pablo Hernandez-Becerro

17:30  P10- Integrated Multilateration for Machine Tool Automatic Calibration
Unai Mutilba, Jose Antonio Yague-Fabra (2), Eneko Gomez-Acedo,
Gorka Kortaberria, Aitor Olarra

18:00  P11- Error Mapping of Rotary Tables in 4-Axis Measuring Devices Using a Ball Plate Artifact
Qichang Wang, Jimmie Miller, Axel von Freyberg, Norbert Steffens,
Andreas Fischer, Gert Goch (1)
SESSION on Surfaces (S)

Wednesday, 22 August 2018 08:00 - 12:00
Room: Hana D, 4F

08:00  S1- Rapid Surface Nitriding of Titanium Alloy by a Nanosecond Fiber Laser under Atmospheric Conditions
Kazutoshi Katahira (2), Yusuke Tanida, Shogo Takesue, Jun Komotori

08:30  S2- Influence of Skin-Layer Microstructure in Ultrafast Laser Surface Treatment
Luca Romoli (2), Gianmarco Lazzini, Laura Gemini, Francesco Fuso

09:00  S3- Fabrication of Un-Coated Transparent Superhydrophobic Sapphire Surface Using Laser Surface Ablation and Heat Treatment
Chi-Vinh Ngo, Doo-Man Chun (2)

09:30  S4- Effect of Different Laser-Induced Periodic Surface Structures on Polymer Slip in PET Injection Moulding
Marco Sorgato, Davide Masato, Giovanni Lucchetta (2), Leonardo Orazi (2)

10:30  S5- Machining-Induced Surface Transformations of Magnesium Alloys to Enhance Corrosion Resistance in Human-Like Environment
Stefania Bruschi (1), Rachele Bertolini, Andrea Ghiotti (2), Enrico Savio (1), Wei Guo, Rajiv Shivpuri (1)

11:00  S6- Influence of Complementary Machining on Fatigue Strength of AISI 4140
Michael Gerstenmeyer, Frederik Zanger, Volker Schulze (2)

11:30  S7- Novel Magneto-Rheological Finishing Process of KDP Crystal by Controlling Fluid-Crystal Temperature Difference to Restrain Deliquescence
Yuehong Yin (2), Yifan Zhang, Yifan Dai, Qi Xiao, Guipeng Tie
Wednesday, 22 August 2018
Room: Hana D, 4F

13:30  Keynote S- Multiscale Analyses and Characterizations of Surface Topographies

14:00  S8- Joining Strength Dependence on Molding Conditions and Surface Textures in Blast-Assisted Metal-Polymer Direct Joining
Yusuke Kajihara, Yuta Tamura, Fuminobu Kimura, Gota Suzuki, Naotake Nakura, Eiji Yamaguchi / Shoichi Shimada (1)

14:30  S9- Anchoring and Chemical-Bonding Effects of Anodic Alumina Microstructure on Adhesion Strength
Keisuke Nagato, Takumu Yamaguchi, Masayuki Nakao (1)

15:00  S10- Fusion of Photogrammetry and Coherence Scanning Interferometry Data for All-Optical Coordinate Measurement
Richard Leach (2), Danny Sims-Waterhouse, Fabrizio Medeossi, Enrico Savio (1), Simone Carmignato (2), Rong Su
Welcome and Opening Remarks
Dr. Ö.S. Ganiyusufoglu

Presentation of CIRP Industrial Technical Papers (ITP)

a) Realization of Industry 4.0 with High Speed CT in High Volume Production
   Dr. Martin B. Bauza a.o. – Carl Zeiss Industrial Metrology, USA

b) Thermal Displacement Reduction and Compensation of a Turning Cell
   Dr. Makoto Fujishima a.o. – DMG MORI Co., Ltd., Japan

c) On the Tracking of Individual Workpieces in Hot Forging Plants
   Prof. Mathias Liewald a.o. – University of Stuttgart, Germany

d) Complementing and Enhancing Definitions of Position Tolerance for a Real Point Based on ISO Geometrical Product Specifications (GPS)
   Yiqing Yan a.o. – Mercedes Benz Cars, Germany

10:00 - 10:30 Coffee Break

Company Presentation

a) CFK Valley, Stade/Germany
   Prof. Wolfgang Hintze – New Corporate Member

b) TechSolve, Cincinnati/ USA
   Dr. Radu Pavel

Technical Presentations

a) "Biological Transformation of Manufacturing"
   Prof. R. Neugebauer – President Fraunhofer Gesellschaft, Germany

b) "Sustainable Development Goals (SDGs)"
   Examples for Implementation in Machine Tool Industry
   Dr. M. Mori – President DMG MORI Co., Ltd.

Global Productivity. Quo vadis? How Can CIRP/CMAG Contribute?
Follow up Dr. Ö.S. Ganiyusufoglu

Various Issues and Closing
Dr. Ö.S. Ganiyusufoglu
Welcome Reception
Date: Sunday, 19 August
Time: 19:00 - 21:00
Venue: Hana Room on 4F, Keio Plaza Hotel
Dress code: Semi-formal, Business casual
Catch up with colleagues and friends at this first networking opportunity at the General Assembly. A buffet-style meal will be provided.

Opening Session and Opening Ceremony
Date: Monday, 20 August
Time: 09:00 - 12:00
Venue: Yasuda Auditorium, The University of Tokyo
Dress code: Semi-formal
Leading experts from Japan will give special lectures, and a commemorative performance of Japanese traditional court music is planned.
Shuttle buses from Keio Plaza Hotel to the University of Tokyo will be operating between 07:50 and 08:15. You can find the meeting point in the lobby on the 3F, Keio Plaza Hotel.

Assembly Dinner
Date: Wednesday, 22 August
Time: 20:00 - 22:30
Venue: Peacock Room, 2F, Main Building, Imperial Hotel Tokyo
Address: 1-1-1 Uchisaiwaicho, Chiyoda, Tokyo 100-8558
Tel: 03-3504-1111
Dress code: Semi-formal
Enjoy an elegant dinner, seated and served, along with special entertainment.
Booking of specific seats at the tables can be done at the registration desk. Please submit your seat booking form by noon on 21 August. (The booking form is available at the registration desk.)
Shuttle buses from Keio Plaza Hotel to the venue will be operating between 18:50 and 19:20. You can find the meeting point in the lobby on the 3F, Keio Plaza Hotel.
Return shuttle buses to Keio Plaza Hotel will be also available.
Farewell Dinner

Date: Saturday, 25 August
Time: 19:30 - 22:00
Venue: Concord Ball Room, 5F, Keio Plaza Hotel
Dress code: Semi-formal, Business casual

Savor the final night of the General Assembly with old and new friends/colleagues at this seated-and-served dinner, where Japanese traditional attractions will be performed.

Booking of specific seats at the tables can be done at the registration desk. Please submit your seat booking form by noon on 24 August. (The booking form is available at the registration desk.)
ACCOMPANYING PERSONS’ PROGRAMME

Monday, 20 August

TO-1H: Asakusa Tour

Tour Itinerary
12:30 Depart from The University of Tokyo
13:00 Lunch
14:15 Explore Senso-ji temple / Asakusa Sightseeing
15:15 Tokyo sightseeing (drive through)
16:00 Arrive at Keio Plaza Hotel

Enjoy Asakusa where the atmosphere of the Tokyo of past decades remains. You can try one of the most famous Japanese foods, Tempura, for lunch and look around must-see spots in Tokyo from the bus.

Tuesday, 21 August

TO-2A: Tokyo 1-Day Tour

Tour Itinerary
09:00 Depart from Keio Plaza Hotel
09:50 Ryogoku /Yukata wearing experience
11:00 Edo Tokyo Museum
12:10 Lunch
13:40 Change into plain clothes from Yukata
14:30 Sumida River Cruise
16:30 Arrive at Keio Plaza Hotel

Take this opportunity to try Japanese Summer traditional cotton kimono, "Yukata" and explore the authentic atmosphere of an old Japanese town re-created in the Edo-Tokyo Museum. You can enjoy great views of Tokyo from a new perspective on the Sumida river cruise after the traditional Japanese culture experience.
Wednesday, 22 August
You can choose one tour from 2 options.

**TT-3A: Mt. Takao 1-Day Tour**

Tour Itinerary

- **08:30** Depart from Keio Plaza Hotel
- **09:50** Mt. Takao
- **13:00** Lunch
- **15:45** Arrive at Keio Plaza Hotel

See a different side of Tokyo by walking the trail up Mt. Takao led by an experienced guide and explore the charming natural scenery of the Tama area. You will ride halfway up the mountain in the cable car, and continue climbing on foot up to the Takao-san Yakuo-in Temple. Relax and enjoy lunch after the walk.

**TT-3H: TOKYO SKYTREE® & Japanese Culture experiences**

Tour Itinerary

- **09:00** Depart from Keio Plaza Hotel
- **09:50** TOKYO SKYTREE®
  (Observation Deck & Shopping at Tokyo Solamachi)
- **12:30** Lunch at Keio Plaza Hotel
- **14:00** Japanese Culture Experience courses
  - Japanese calligraphy
  - Japanese woodblock print
- **15:30** Conclusion of the tour

Arrive at the massively popular TOKYO SKYTREE and enjoy the best views of Tokyo from the observation deck. The bustling Tokyo Solamachi shopping district below also offers great chances to pick up some souvenirs. After visiting the TOKYO SKYTREE area, Japanese culture experience courses will be given at the Keio Plaza Hotel.


* Sponsored by Tokyo Metropolitan Government.
  Participants of the above complimentary programmes may be photographed/filmed by an authorised photographer/camera operator for Tokyo Convention and Visitors Bureau (TCVB) record-keeping purposes and for use in future Tokyo PR.
  By registering for these programmes, you agree that your image may be used in full/in part and distributed for the above-mentioned purposes.
Thursday, 23 August

TO-4A: Kamakura 1-Day Tour

Tour Itinerary
10:00  Depart from Keio Plaza Hotel
11:30  Kamakura Kotoku-in
       (Great Buddha of Kamakura)
12:50  Lunch
14:50  Komachi-dori Street
18:00  Arrive at Keio Plaza Hotel

Kamakura was once the political centre of Japan during the Kamakura Period (1185 to 1333) which is known for the rise of the samurai. The Great Buddha of Kotoku-in Temple is one of three large Buddha statues in Japan, and a must-visit place in Kamakura. You will also walk through the Komachi-dori Street, a 360 metres long shopping street.

Friday, 24 August

TO-5B: Yokohama 1-Day Tour

Tour Itinerary
09:00  Depart from Keio Plaza Hotel
10:00  Sankei-en Garden
12:15  Lunch
14:45  Afternoon Tea Cruise
17:15  Arrive at Keio Plaza Hotel

Explore Sankei-en Garden, a traditional Japanese style garden which exhibits a number of historic buildings from across Japan. After lunch, enjoy the cruise that circles Yokohama Bay.
OUR THANKS FOR THE SUPPORT TO OUR SPONSORS:

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