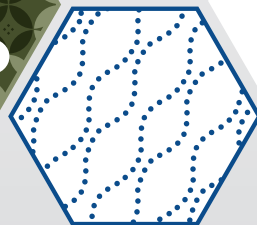


The 26<sup>th</sup>

**S** MALL  
**E** POWERTRAINS AND  
**N**ERGY SYSTEMS  
**T** TECHNOLOGY  
**C** ONFERENCE



**SETC**  
2022



## PRELIMINARY PROGRAM

Digital and In-person or Digital

October 31 – November 3, 2022

Himeji, Hyogo, Japan (Venue: Arcrea HIMEJI) and online







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# Program at-a-Glance

	Mon., Oct. 31	Tue., Nov. 1	Wed., Nov. 2	Thu., Nov. 3
08:00-09:00				Technical Sessions & NPT Session
09:00-10:00		Technical Sessions & NPT Session	Technical Sessions & NPT Session	Networking Break
10:00-11:00		Networking Break	Networking Break	Technical Sessions & NPT Session
11:00-12:00		Technical Sessions & NPT Session	Technical Sessions & NPT Session	Lunch / Awards & Closing Ceremony
12:00-13:00		Lunch	Lunch	
13:00-14:00		Technical Sessions & NPT Session	Technical Sessions & NPT Session	
14:00-15:00	Opening Ceremony Keynote Addresses	Networking Break	Networking Break	
15:00-16:00	Networking Break	Technical Sessions & NPT Session		
16:00-17:00	Technical Sessions & NPT Session	Networking Break	Plenary Session	
17:00-18:00	Networking Break	Technical Sessions & NPT Session		
18:00-19:00	Technical Sessions & NPT Session			
19:00-20:00			Banquet	
20:00-20:30				

Location	Event	Room
Arcrea HIMEJI (Himeji Culture and Convention Center)	Registration	Foyer in front of Exhibition Hall C
	Poster Session	Foyer on 4th Floor
	Opening Ceremony, Keynote Addresses, Plenary Session, Awards & Closing Ceremony	Exhibition Hall C
	Technical Sessions, New Product Technology Sessions	Exhibition Hall C and Meeting rooms on 4th Floor (402 & 403, 407, 408)
	Lunch	Exhibition Hall C
	Exhibition & Networking Break	Exhibition Hall C
Hotel Nikko Himeji	Banquet	Ballroom 'Korin' (3rd Floor)

Note: Room and time are subject to change in the final program.

# Introduction of SETC2022

## Theme

### Challenges for Small Powertrains and Energy Systems Technology in a Carbon Neutral Society

Since its first event in 1989, Small Powertrain and Energy systems Technology Conference (SETC) continues to be the international technology conference for small powertrains and related products. SETC is jointly held each year by the Society of Automotive Engineers of Japan, Inc. (JSAE) and SAE International. JSAE is pleased to host the 26th SETC at Arcree HIMEJI, Himeji Culture and Convention Center, from October 31 through November 3, 2022 with the cooperation of Japan Land Engine Manufacturers Association (LEMA).

The efforts that researchers and engineers, including SETC participants, must take in order to achieve both carbon neutrality and the economy are diverse and have major challenges.

As the main theme, SETC2022 has chosen the technological challenges to realize carbon neutrality in order to contribute to technological evolution and industrial promotion.

Although we had no option but to cancel two conferences of SETC in a row due to the tragic pandemic caused by COVID-19, now, thanks to generous support of yours and painstaking efforts of the committee members, we have resumed the preparation for the coming conference of the year 2022. We would like to express our deep appreciation. Also, together with local people of Himeji, the town of the world famous castle, we are looking forward to the day to meet you in the renovated SETC2022.

(Be aware that, in the case of another surge of the pandemic, the conference could be operated online only.)

### The History of SETC

City			Country		
1989	Milwaukee	USA	2009	Penang	Malaysia
1991	Yokohama & Hamamatsu	Japan	2010	Linz	Austria
1993	Pisa	Italy	2011	Sapporo	Japan
1995	Milwaukee	USA	2012	Madison	USA
1997	Yokohama	Japan	2013	Taipei	Taiwan
1999	Madison	USA	2014	Pisa	Italy
2001	Pisa	Italy	2015	Osaka	Japan
2002	Kyoto	Japan	2016	Charleston	USA
2003	Madison	USA	2017	Jakarta	Indonesia
2004	Graz	Austria	2018	Duesseldorf	Germany
2005	Bangkok	Thailand	2019	Hiroshima	Japan
2006	San Antonio	USA	2022	Himeji	Japan
2007	Niigata	Japan			
2008	Milwaukee	USA			



# Introduction of SETC2022



**This event has the Endorsement of FISITA.**

Endorsed by FISITA acknowledges the highest quality international technical events and conferences delivered exclusively through the FISITA international membership network.

[www.fisita.com](http://www.fisita.com)

# Sponsors & Advertisers

JSAE Small Powertrains and Energy Systems Technology Conference 2022 committees wish to express sincere gratitude and appreciate strong support of the following companies to the conference. (As of April 28, 2022)

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INTELLIGENCE IN DRIVES

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\*Companies name are in random order

In association with Japan Marine Industry Association (JMIA)

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Yuji Mihara

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(Graz University of Technology)

(Andreas Stihl AG & Co. KG)

# Conference Registration

## Registration Fee

(Tax is included)

Category	Advanced Online Registration <sup>1)</sup> until Friday, September 16	Online Registration <sup>2)</sup> On-site Registration
Presenting Author and Session Chair/Co-chair <sup>3)</sup>	JPY 49,500	
JSAE/SAE Member <sup>4)</sup>	JPY 55,000	JPY 66,000
Student <sup>5)</sup>	JPY 3,300	JPY 4,400
Accompanying Person <sup>6)</sup>	JPY 6,600	JPY 6,600
Other than Those Above	JPY 66,000	JPY 77,000
Media <sup>7)</sup>	Free	Free

\*JPY = Japanese Yen

- 1) Advanced online registration will begin from early August till mid-September. Registration fee payment must be made with advanced registration.
- 2) Online registration will close on Friday, October 14.
- 3) Presenting authors including ones for New Products Technology Session and session chairs/co-chairs are required to register and make payment by Friday, September 16, 2022. Please contact the Conference Secretariat if it is difficult to do so. Otherwise, your paper will be deemed as withdrawn and thus will not appear in the proceedings.
- 4) JSAE corporate membership is inapplicable but an individual membership only.
- 5) Student includes a student presenting author who may be requested to show an ID on site.
- 6) Accompanying person is a family member of other category's participant except "Student," and is limited for one person only.
- 7) Limited to corporations with regular issues.

## Entitlements of Registration Fee

- Admission to the Opening, Awards & Closing Ceremony
- Admission to Keynote Addresses and Plenary Session
- Admission to Technical Sessions and Keyword to Download the Proceedings
- Admission to the Exhibition & Poster Session
- Admission to Networking Breaks

**Note:** Neither an accompanying person nor an exhibitor is entitled for technical sessions and proceedings.

## Lunch JPY 550 each (Tax is included)

Since food loss should be avoided from the viewpoint of SDGs, the committee has decided to ask attendees, if preferred, to buy lunch in advance on the registration with expectation of less or no discard of prepared foods. A Bento and packed green tea will be provided on site every day during the conference. Please be sure you will get rather an authentic *Bento* which is valued double the price and made by a local food company with a good reputation.

# Conference Registration

## Pay Events

### Optional Tour **JPY 2,500** (Tax is included)

Date: Thursday, November 3

Time: 13:00 - 17:30

**Note:** Please apply for the option tour in online registration. On-site application is not acceptable.  
The fee does not include lunch.  
See more details in the page 18, "Optional Tour."

### Banquet **JPY 6,050** (Tax is included)

Date: Wednesday, November 2

Time: 19:00 - 21:30

Place: Hotel Nikko Himeji

Transportation: Shuttle bus (one way from Arcrea Himeji to Hotel Nikko Himeji) or 15 min walk

**Note:** Please apply for the banquet in online registration. On-site application is not acceptable unless there is any cancellation. See more details in the page 19, "Banquet."

## Payment Methods

### Online Registration

All Payment must be made in Japanese Yen (JPY) with:

Credit Card: VISA / MasterCard / American Express / JCB are acceptable.

Bank Transfer: Only for those who will register in Japan if preferred.

**Note:** A personal check is unacceptable.

### On-site Registration

All Payment must be made in Japanese Yen (JPY) with:

Credit Card: VISA / MasterCard / American Express / JCB are acceptable.

**Note:** Cash is unacceptable.

## Cancellation Policy

By Friday, September 16	90% of the registration fee less handling charges to be refunded.
By Friday, October 14	50% of the registration fee less handling charges to be refunded.
After Friday, October 14	No refund

**Note:** Cancel request must be e-mailed to the SETC2022 Email: setc2022-regist@or.knt.co.jp



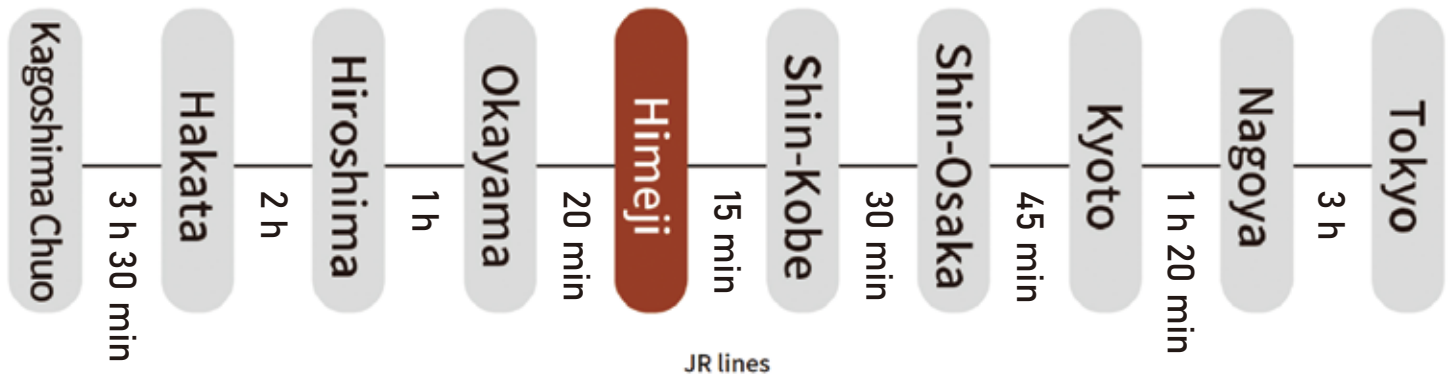
# Access to Venue -1-



## By railway

Just 3 hours' ride of the Nozomi Shinkansen from Tokyo plus 15 minutes' walk will bring you to the venue without any trouble. Providing comfortable hotels and cozy restaurants conveniently located around the station, the city of Himeji welcomes you.

Please be aware that some of Nozomi Shinkansens pass Himeji station. It is highly recommended to check out the timetable in advance or ask advice of JR, the railway company.

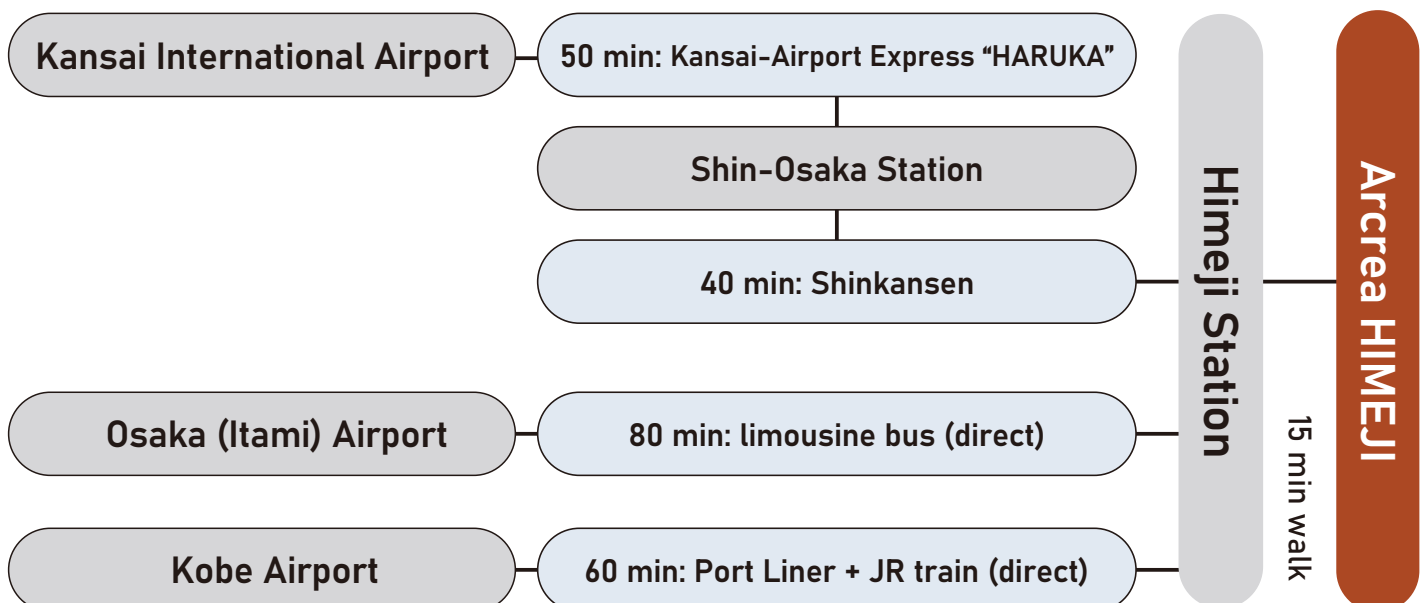


60 min from Osaka

• • • special rapid service: Osaka Sta. → (20 min) Sannomiya Sta. → (40 min) → Himeji Sta.



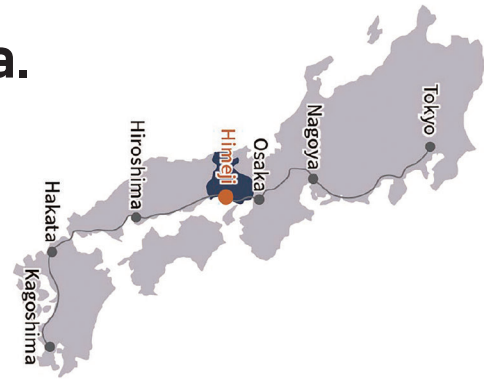
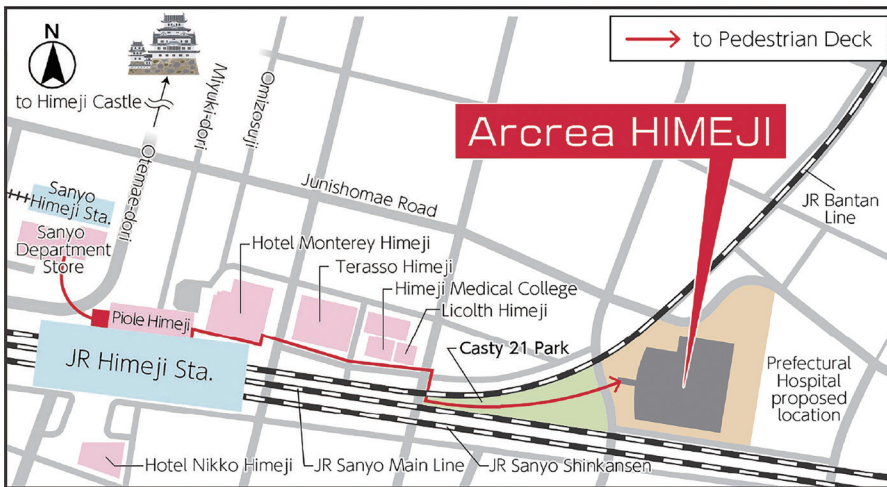
## By plane



\*The JAPAN RAIL PASS is valid for all JR Group Railways and Shinkansen "bullet trains", limited express trains, express trains, and rapid or local trains, except any reserved or non-reserved seat on "NOZOMI" and "MIZUHO" trains. The pass holders must take "HIKARI," "SAKURA," or "KODAMA," trains.

# Access to Venue -2-

## From Himeji Sta.



**About 15 min walk from  
Himeji Station**

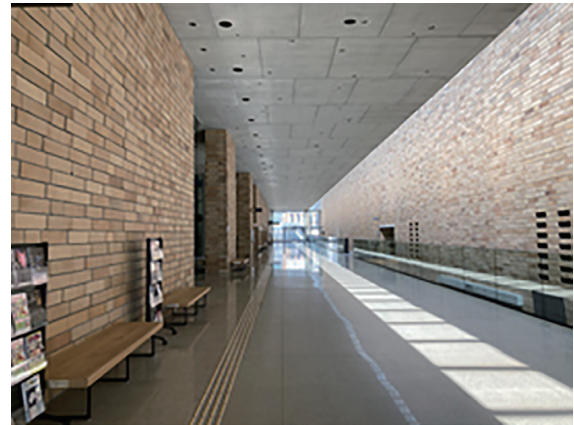
**– a hub of Shinkansen and local  
trains, private railways, buses,  
and other transport modes**





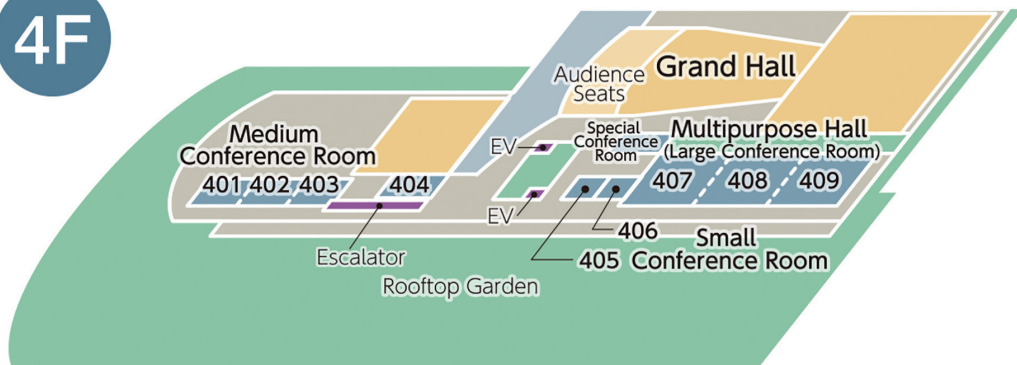
# Venue

## Arcrea HIMEJI (Himeji Culture and Convention Center)

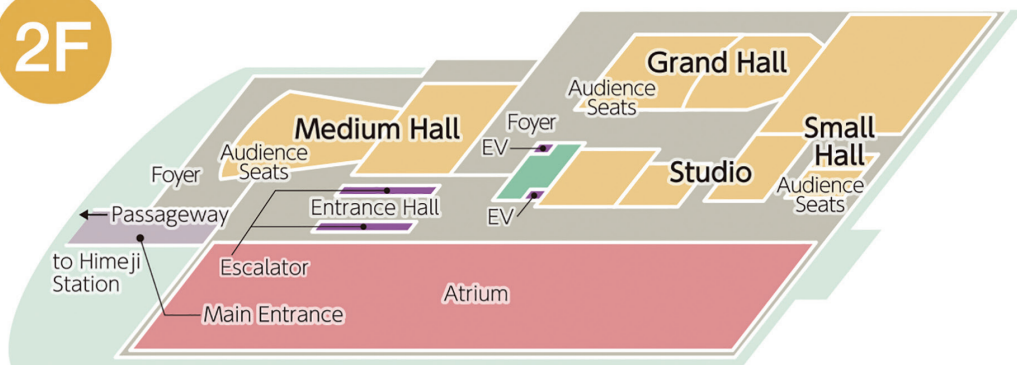


Exterior and interior views and the layouts of the conference sites

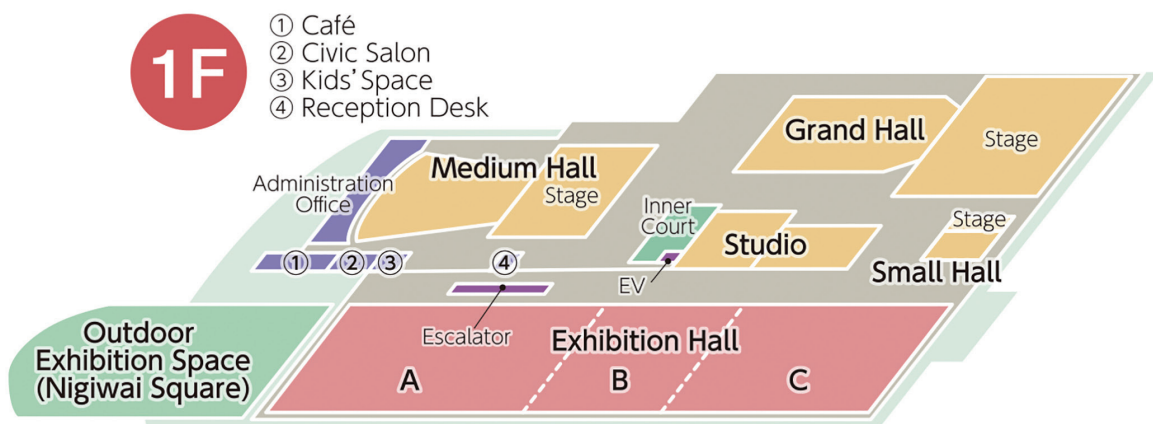
4F



2F



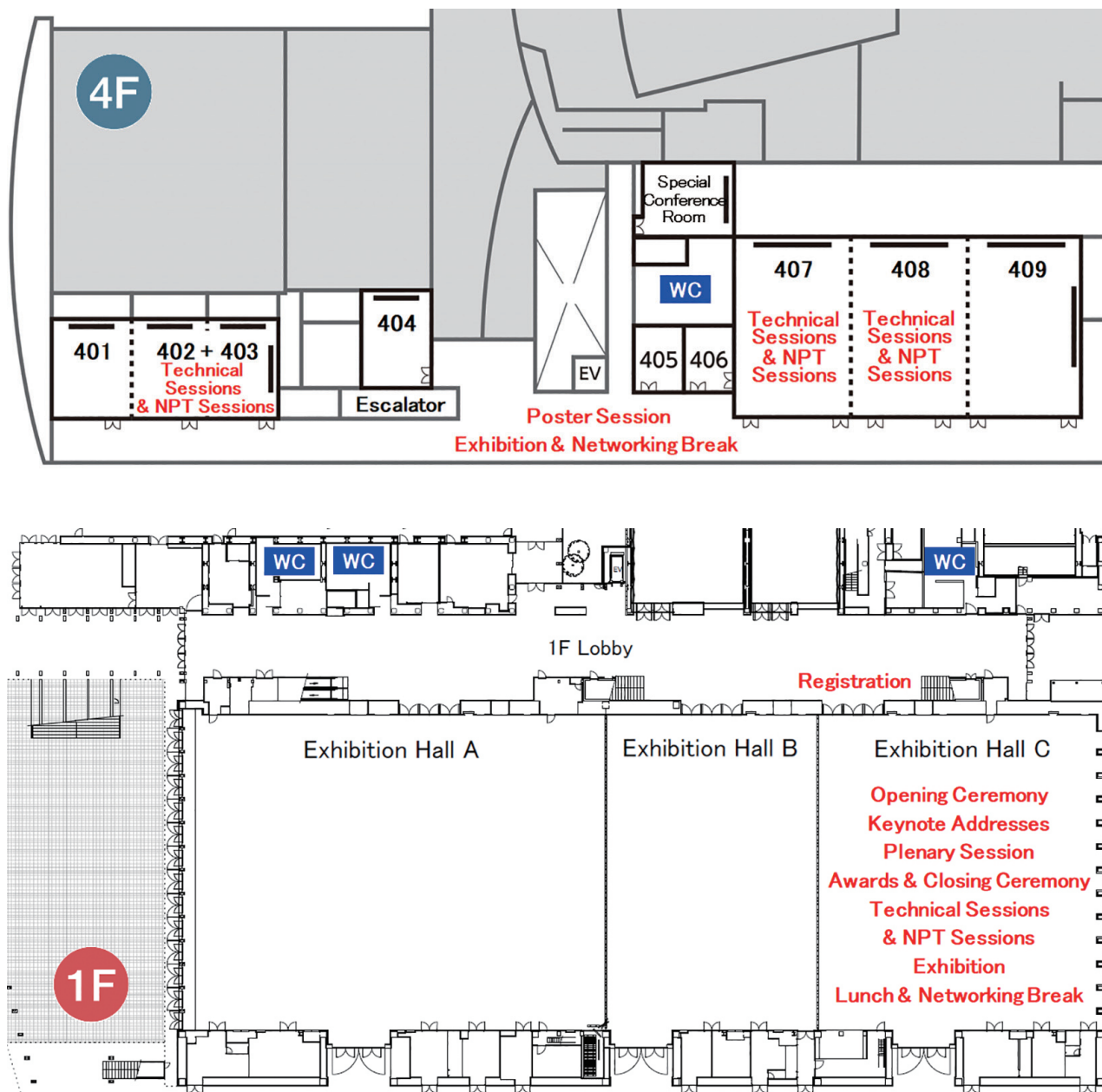
1F





# Venue

## Arcrea HIMEJI (Himeji Culture and Convention Center)



### ■ Lunch

- Your box lunch can be picked up in front of the "Exhibition Hall C" on the first floor (1F).

### ■ Free Wi-Fi Service

- Available in the building

### ■ Baggage Lockers

- Available on the first floor (1F)

### ■ Smoking

- Not allowed in the whole building
- Smoking area is located at outside of the building.

# Exhibition & Poster Session

## Exhibition

**Period:** Monday, October 31 through Thursday, November 3  
**Place:** Exhibition Hall C, 1F \*

The technical exhibition offers an excellent showcase for small power source manufacturers as well as related component & equipment suppliers, measurement instruments and system providers in the peripheral industries in exchange of technological opinions and ideas with the researchers and engineers who mainly present research papers or support research work.

\* Depends on the number of exhibitors, 2nd place will be prepared.

## Opening Hours

Monday, October 31	13:30 - 18:00
Tuesday, November 1	8:30 - 18:00
Wednesday, November 2	8:30 - 17:30
Thursday, November 3	8:30 - 12:30



## Application for an Exhibit Space Reservation and Fee

@ JPY120,000 (Tax is not included)

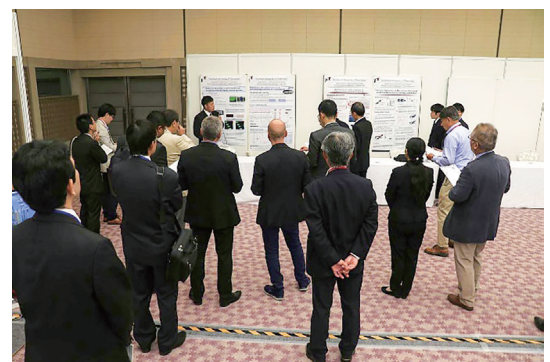
The application due Wednesday, August 31.

Please find more information at the following SETC2022 web site: <https://www.setc-jsae.com/>

## Poster Session

**Period:** Monday, October 31 through Thursday, November 3  
**Place:** Hallway to the Session Rooms, 4F

For academia, the poster session is aimed at undergraduate and graduate university students who would like to expose their research activities to the participants of the conference. For companies and institutes, the poster session is also aimed to promote the challenging exploratory study which does not have enough data but is innovative. A short oral presentation by a student will be requested to evaluate for an award.



## Opening Hours

Monday, October 31	13:30 - 18:00
Tuesday, November 1	8:30 - 18:00
Wednesday, November 2	8:30 - 17:30
Thursday, November 3	8:30 - 12:30

## Application for Poster Session

Free participation, but presenters must register to attend SETC2022. The details are announced at the SETC web site: <https://www.setc-jsae.com/>

# New Product Technology Session

The new session called the “New Product Technology Session (NPTS)” was set up to provide a forum for discussion from a technological perspective on the results of products and services as an outlet for technology, with the expectation that it will encourage further technological evolution and contribute to the promotion of related businesses.

NPTS will introduce a wide range of new products, services, manufacturing devices, development tools including software and other new items from technical perspective.

In the technical field handled by SETC, the various products and services are produced around the world every day, and the latest technologies are used to enhance customer value. This session will focus on the technologies that make them possible, and will show the superiority and novelty of functions, performance advantages, and value proposition related to the products and services. Leading to further technological evolution and value creation are expected through this session.

A new venue layout concept called the “Co-Location concept” was adopted in NPTS. By holding this session in the same hall as the exhibition, the participants are able to discuss the content of the presentations at the session while looking at the product itself or the product catalog. It is also expected to promote networking.

## Communication between presenters, exhibitors and all participants

NPTS presentation will be held in the exhibition hall



Discussing about the products or services with the participants of SETC



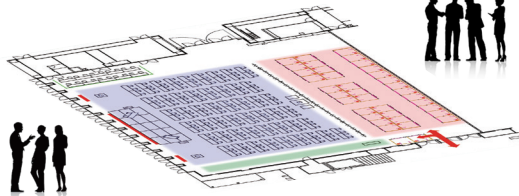
Co-location



Catalog distribution



Interaction between participants and exhibitors



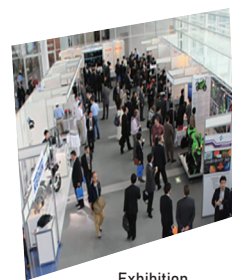
Product Technology



Discussing/Connection



Introduction/Conversation



Exhibition

The scope covered in this session is as follows.

Technology presentation on

- products sold or shortly planned to be sold in the market.
- services provided or shortly planned to be provided in the market using the products.
- manufacturing devices of the products.
- development equipment of the products (e.g., measuring equipment).
- software for development or manufacturing of the products.

Please refer to the document uploaded at the SETC2022 web site (<https://www.setc-jsae.com/npts.html>) for more information.

# New Product Technology Session

(As of April 29, 2022)

## New Product Technology

Organizers: Yuji Araki (Yamaha Motor Co., Ltd.), Maurizio Marcacci (Piaggio & C SpA)

NPT2022-001	<b>Development of Handy Portable Generator, “EU3200i”</b> Hiroshi Koyama, Mitsutoshi Hirata (Honda R&D Co., Ltd.)
NPT2022-002	<b>Development of Titanium-Oxide Heated Exhaust Gas Oxygen Sensor for Advanced Engine Management system in Small Motorcycles</b> Akhilesh Jain (Napino Auto & Electronics Ltd.), Ken Ervin Fossaen (Kerdea Technologies)
NPT2022-003	<b>2021 Model ROV WOLVERINE RMAX2/RMAX4</b> Toshikazu Sugiura (Yamaha Motor Co., Ltd.)
NPT2022-004	<b>Unique Theory of the Operating Engine Simulation to Investigate the Noise/Vibration Mechanism</b> Arata Miyauchi, Masanori Ogawa, Kanno Masatoshi, Taigo Yukisawa (ESTECH Corporation)
NPT2022-005	<b>Development of the FX820V air-cooled V-Twin engine for lawn mowers</b> Kobayashi Yasutaka (Kawasaki Motors, LTD.)
NPT2022-006	<b>Development of 6.1L Diesel Engine V6108 for Tractor in compliance with EU Stage V Non-Road Emission Standards</b> Naoya Junicho (Kubota Corporation)
NPT2022-007	<b>Development of the hybrid powertrain for small scooters in ASIA market</b> Hiroshi Funakoshi (Yamaha Motor Co., Ltd.)
NPT2022-008	<b>New electric propulsion system “HARMO” creates new marine experience</b> Maejima Masaki (Yamaha Motor Co., Ltd.)
NPT2022-009	<b>Introduce of eGX, 2kW class packaged multipurpose electric power unit powered by exchangeable lithium ion battery</b> Shunsuke Sawasaki (Honda R&D Co., Ltd.)
NPT2022-010	<b>New possibility of motorcycles, ships and other applications using new lithium-ion battery SCiB(TM)</b> Kazuhiro Namba, Masahiro Sekino (Toshiba corporation)
NPT2022-011	<b>Development of 2021 MT-09</b> Nobuyuki Miyoshi (Yamaha Motor Co., Ltd.)
NPT2022-012	<b>2.5 kW class NEO'S Electric Scooter with Removable Battery</b> Ryosuke Yamasaki (Yamaha Motor Co., Ltd.)
NPT2022-013	<b>DX for productivity improvement, “Smart Manufacturing Solutions”</b> Kazuhito Ueda (Hexagon)

# New Product Technology Session

NPT2022-014	<b>The Cost Effective 48V Inverter</b> Chihiro Hoshino (Nidec Elesys Corporation)
NPT2022-015	<b>The PRUFREX Motor Management System (MMS-AL) With Model-based Development and Simulink Blockset-library</b> Katharina Liebel, Martin Zappe (PRUFREX Innovative Power Products GmbH)
NPT2022-016	<b>Modelling Gear Manufacture for Efficient Production</b> Michael Fish (Dontyne Systems)
NPT2022-017	<b>Development of NT1100</b> Tasuku Oyama (Honda Motor Co., Ltd.)
NPT2022-018	<b>Development of H'ness CB350</b> Hidetoshi Wakasa (HRC)
NPT2022-019	<b>Development of DAX125</b> Takashi Yagi (Honda Motor Co., Ltd)
NPT2022-020	<b>(Tentative) Development of Hawk11</b> TBD (Honda Motor Co., Ltd.)
NPT2022-021	<b>Styling Design for Gold Wing - Clay Model -</b> Hidekazu Iwata (Honda R&D Co., Ltd.)
NPT2022-022	<b>Energy saving by using hybrid system of heat treatment heat source</b> Tsubasa Mori (Honda Motor Co., Ltd.)
NPT2022-023	<b>Development of tool runout detection function in processing equipment</b> Takuya Kido (Honda Motor Co., Ltd.)
NPT2022-024	<b>(Tentative) Cogeneration system using a biomass gas engine</b> Hiroyuki Otsubo (YANMAR ENERGY SYSTEM CO., LTD.)

## Notes:

The New Product Technology Session papers will NOT be published as JSAE/SAE papers and the paper numbers will be used only for paper identification and management.

The session matrix will be available at the following website in early October.

<https://www.setc-jsae.com/>



# Optional Tour

**DATE:** Thursday, November 3  
**TIME:** 13:00 - 17:30

The technical visit, that has been a customary event of SETC, will not be held during SETC2022 due to scheduling restrictions. Instead, we planned a half-day tour to the historic Himeji Castle and a time-honored Sake brewery, which we believe will offer a good opportunity for the participants to explore the cultural aspect of the city. The tour will depart from Arcree HIMEJI on November 3rd at 13:00 after the closing ceremony of SETC2022.

At Himeji Castle, a World Heritage Site, you will enjoy the guided tour in its vast grounds including the interior of the castle tower, one of Japan's National Treasure. At Nadagiku Sake Brewery, you will be greeted by the savor of old sake brewery that retains the appearance of its founding in 1910. After walking through the brewery, you can enjoy sake tasting and shopping for sake-related products.



## 世界遺産 姫路城 World Heritage Himeji Castle



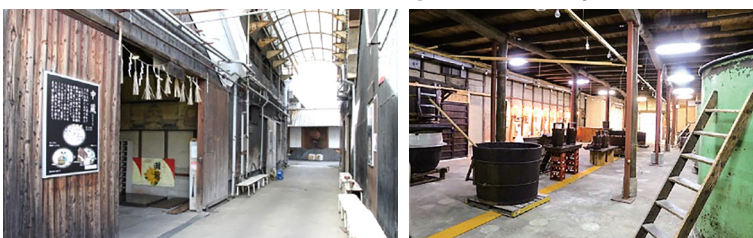
In the year 1333, Norimura Akamatsu (Enshin) built a fortress on Himeyama. Afterwards, Himeji Castle was expanded by feudal lords; Hideyoshi Toyotomi, Terumasa Ikeda, Tadamasa Honda and others, until it came into being in its entirety, as we see it today, in 1617.

Because of its shape and brilliant white exterior, as it stands out against the blue sky, it looks like a white egret flying up from the water, and so it is known familiarly as White Egret Castle.

In 1993 Himeji Castle was designated as Japan's first World Cultural Heritage site by UNESCO. It was acclaimed for "the degree of perfection of its wooden architecture, among the best in Japan, and uniquely outstanding internationally as well", and for being "an excellent example of early 17th century castle architecture at its peak, with exceptionally well-preserved wooden structures in the form of the keeps, turrets, and plaster walls, and engineering structures such as the stone walls and moats". It is the best example of Japan's unique defensive castle structure.



## 灘菊酒造株式会社 Nadagiku Brewery



Nadagiku Sake Brewery has six wooden brewery buildings that remain as they were when the brewery was founded in 1910. Please enjoy the quaint atmosphere while strolling around the old Sake the old *Sakaguras* (sake brewery houses). The current sake brewing and manufacturing methods are explained by panel displays, and the tools for sake brewing at the time of its founding are exhibited in the wooden brewery.

Note : - Optional Tour is on-line registration only. On-site registration is not available.  
- Lunch is not included..

# Banquet

**Date:** Wednesday, November 2  
**Time:** 19:00 - 21:30  
**Place:** Hotel Nikko Himeji

This banquet is an excellent opportunity to get together and mingle with your friends spending the night of the conference.

Hotel Nikko Himeji is a landmark hotel in Himeji, and it is located just in front of JR Himeji Station. The banquet will be served at ballroom "Korin," on the 3rd floor of the hotel. A cloakroom is next to the ballroom.

The hotel has obtained the COVID-19 safety approval by Hyogo prefectural authority for the banquet with appropriate preventive measures against COVID-19, such as a thermography for fever screening, alcoholic based sanitizers, transparent partitions, etc. So, the guests can enjoy dinner at ease.

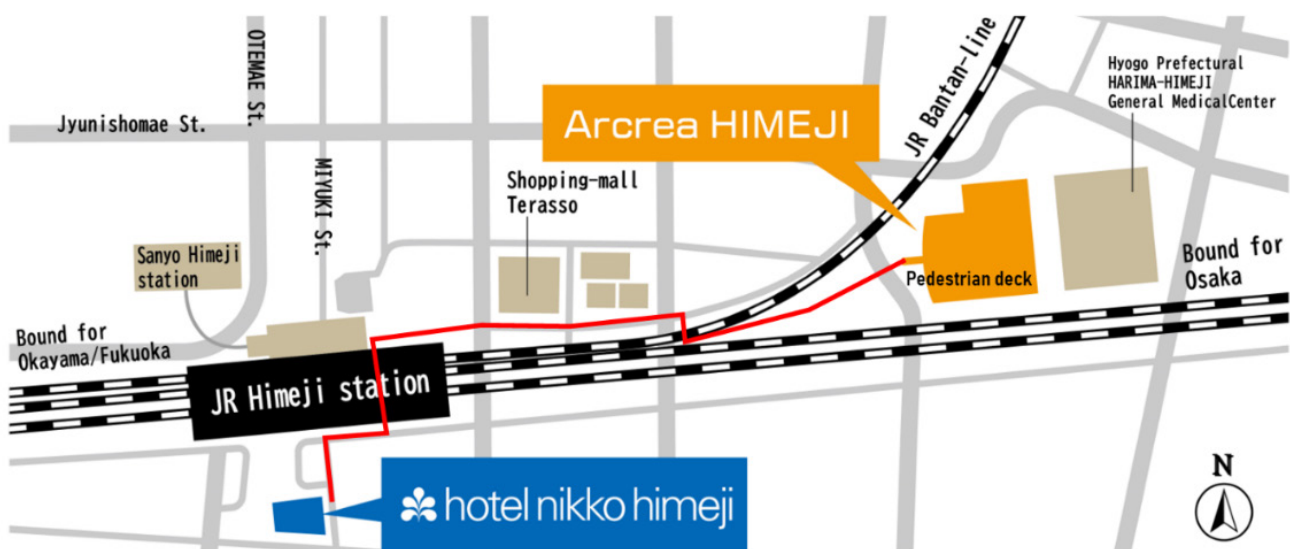
Now we are planning some attraction to provide Japanese atmosphere during the banquet. We hope it would be a memorable moment for all of the guests.

 hotel nikko himeji



## Directions

Hotel Nikko Himeji is conveniently located from Arcrea HIMEJI. You can reach Hotel Nikko Himeji by 15 minutes' walk from a pedestrian deck of Arcrea HIMEJI through a side walk along with JR line. A shuttle bus (one way from Arcrea HIMEJI to Hotel Nikko Himeji) is also available for the guests.



Note: attendance fee: JPY 6,050 (Tax is included)

Online registration is required. No ticket available on the day unless there is any vacancy occurred by cancellation. A person without registration may be declined to apply an on-site registration or put on the waiting list depending on the situation.

# Keynote Addresses

**Date:** Monday, October 31  
**Time:** 14:00 – 15:00  
**Place:** Exhibition Hall C, 1F

## Speech Theme



**Seiichi Kai**

Executive Officer,  
General Manager, Research &  
Development Division,  
Kawasaki Motors, Ltd.



**TBA**

### **Kawasaki Heavy Industries, Ltd. (till September, 2021)**

- 1989 – 2005 Engineer, Engine design for general purpose engines and motorcycles, Research & Development Division
- 2006 – 2010 Manager, Section 1, Engineering Department 3, Research & Development Division
- 2011 – 2012 Senior Manager, Engineering Department 4, Research & Development Division
- 2012 – 2018 Senior Staff Officer in charge of engineering design, Research & Development Division
- 2018 – 2021 Associate Officer, General Manager, Quality Assurance Division
- 2021 – Executive Officer, General Manager, Research & Development Division

### **Kawasaki Motors, Ltd. (since October, 2021)**

- 2021 – Executive Officer, General Manager, Research & Development Division

## Speech Theme



**Robert Olma**

Vice President,  
Global Governmental Relations,  
ANDREAS STIHL AG & Co. KG



### **Between the priorities of technical progress and legal regulations**

#### **Education:**

- 1997 – 2002 M.A.: History of Eastern Europe, European Politics  
University of Göttingen — Göttingen
- 2000 – 2001 Bachelor Studies: History and Philosophy  
University of Wales — Lampeter
- 2003 – 2004 Master of European Studies: Politics, Economics,  
Law Center for European Integration Studies — Bonn

#### **Career:**

- 02/2005 – 10/2008 Head of Office of Member of European Parliament  
European Parliament – Brussels
- 01/2009 – 07/2012 Business Director, EU.select GmbH — Brussels
- 08/2012 – 12/2017 Senior Consultant, EUTOP Brussels SPRL — Brussels
- 01/2018 – 08/2021 Director, EUTOP Brussels SPRL — Brussels
- 09/2021 Vice President Global Governmental Relations  
ANDREAS STIHL AG & Co. KG — Waiblingen



# Plenary Session

**Date:** Wednesday, November 2  
**Time:** 15:00 - 17:30  
**Place:** Exhibition Hall C, 1F

## Theme

### Hydrogen energy

The realization of a carbon-neutral society, SETC2022 theme, has become long term issue for not only for industry but also humankind. Nevertheless, humankind continues to develop newly energy source, because to make better life quality and freedom of movement. As such, possibility of several newly energy sources is actively discussing all over the world.

SETC2022 provides opportunity to know hydrogen energy which is one of the new energy options, and place to discuss about issues facing the small powertrain. Session contents summarize the hydrogen technology how to make, transport, storage, and utilize. And, hydrogen is possible not only direct utilization but also indirect utilization in the way of power storage medium and refining e-fuel. Therefore, I would like to discuss how the utilization of hydrogen energy may contribute to the small power train area toward the realization of a carbon-neutral society.

## Moderator



**Takemi Chikahisa**

Ph.D  
President, Hokkaido  
Polytechnic College  
Professor Emeritus

### Professional Experience

1982 - 1984	Assistant Professor	Dept. of Mechanical Engineering, Hokkaido University
1984 - 2003	Associate Professor	Div. of Mechanical Science, Hokkaido University
2003 - 2019	Professor	Div. of Energy and Environmental Systems, Hokkaido University
2019 -	Present President	Hokkaido Polytechnic College

### Education

1976	Bachelor, Dept. of Engineering, Hokkaido University
1978	Master, Graduate School of Engineering, Hokkaido University
1980	Master of Science, University of Wisconsin-Madison
2000	Doctor of Philosophy, Hokkaido University

### Awards

JSME Medals for Outstanding Papers (Two times), Thermal Engineering Award for Outstanding Academic Contribution of JSME, Engine Systems Award for Academic Achievement of JSME, The Scientific Contribution Award of JSAE, etc.

### Research Backgrounds

In Hokkaido University, he made research on transport phenomena in fuel cell, combustion control in engines, and analysis of optimal energy system in the future. He is now a president of Hokkaido Polytechnic College, one of the ten colleges belonging to Ministry of Health, Labor and Welfare in Japan.

# Plenary Session

## Speakers



**Toshio Fujimura**

Dr. / Visiting professor  
Aichi Institute of  
Technology, Japan

### Subject

*To realize carbon neutrality of automobiles,  
Green energy policy is indispensable!*

### Career

After joining Toyota Motor Corporation in April 1980, engaged in engine design and development for 31 years. I became a professor, Aichi Institute of Technology in 2011, and a visiting professor from April 2018, providing consulting and lecture activities as an advisor to automobile-related companies.

### Education

1978 Bachelor, Dept. of Engineering, Okayama University

1980 Master course, Engineering, Okayama University

### Academic/Social Activities

- The Japan Society of Mechanical Engineers
- Society of Automotive Engineers of Japan

### Awards

- Japan Society of Mechanical Engineers Award Technology Award  
「Diesel PM, NOx simultaneous reduction catalyst system」 2003.4  
“Borchers Award” for doctor thesis

### Research Subject

- Analysis of automotive and environmental technology strategies



**Takashi Yoshiyama**

Senior Manager  
Pilot Project  
Promotion Department /  
Project Group /  
Hydrogen Strategy Division  
Kawasaki Heavy  
Industries, Ltd.

### Subject

*International Hydrogen Supply Chain*

### Career

Joined Kawasaki Heavy Industries, after graduating from 1996 Kobe University.

Engaged in developing coal-firing boilers for power generation, waste incinerator and motorcycle gasoline engine.

Responsible for various projects for realizing hydrogen energy from 2013.

### Education

Graduate School of Engineering, Kobe University

Department of Mechanical Engineering

Science and Technology (Master's Program)

### Research Subject

Mechanical Engineering (Energy, Combustion, Heat Transfer)

# Plenary Session

## Speakers



**Taku Tsujimura**

Doctor of Engineering /  
Team Leader, National  
Institute of Advanced  
Industrial Science and  
Technology (AIST)

### Subject

***Demonstration research on hydrogen energy carriers in Fukushima  
Renewable Energy institute, AIST (FREIA)***

### Career

2004 Starting a Research scientist of AIST  
2010.3 - 2011.10 Visiting Scientist of Lawrence Livermore National  
Laboratory, US  
2012.8 - 2013.7 Group leader, Planning office, AIST  
2013.1 - 2022.3 Team leader of hydrogen energy carrier team  
2022.4 - Team leader of hydrogen energy carrier utilization team setting

### Education

1995 Bachelor, Dept. of Engineering, Doshisha University  
1999 Master course, Engineering, Graduate School, Doshisha University  
2001 Doctor course, Graduate School, Doshisha University  
2004 Earned Doctor of Philosophy, Graduate School, Doshisha University

### Awards

2006 JIME (The Japan Institute of Marine Engineering) Encouragement award  
2008 JSME (The Japan Society of Mechanical Engineers) Encouragement award  
2016 Combustion society of Japan Encouragement award  
2020 Combustion society of Japan Outstanding paper award

### Research Subject

- Combustion diagnostics
- Chemical kinetic modeling
- Renewable energy and its storage
- Production and utilization technologies of hydrogen energy carriers



**Jürgen Guldner**

Ph.D  
General Manager  
Hydrogen Technology  
and Vehicle Projects,  
BMW Group.

### Subject

***BMW iX5 Hydrogen and Fuel Cell Technology***

### Career

Leadership positions at BMW Group:  
1997 Department Manager Advanced Chassis Engineering  
2005 Chief Engineer für BMW X6 ActiveHybrid  
2010 Vice President Chassis R&D  
2018 General Manager Hydrogen

### Education

1992 Master of Science in Electrical Engineering, Clemson University,  
South Carolina (USA)  
1995 Ph.D. in Controls and Robotics, Technical University of Munich (Germany)  
1997 PostDoc at PATH Program, University of California at Berkeley (USA)

Various leader

### Awards

1991 Fulbright Scholarship (for Master's Program at Clemson)  
1993 DAAD Scholarship (for 3-months study at Tokio University)  
1995 Award for PhD Thesis (DLR, Germany)

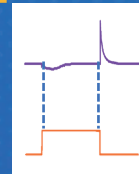
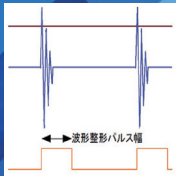


# Measurement of rotation angle signals

Product line-up for accurate measurement of a wide range of rotational speeds and angles, from low speeds to high speed.

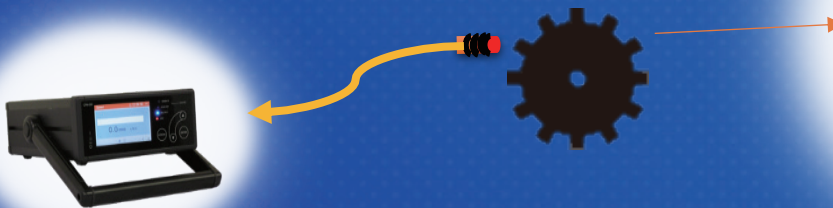


Output of resolver signals as analogue voltages in ABZ phase, angle and speed.

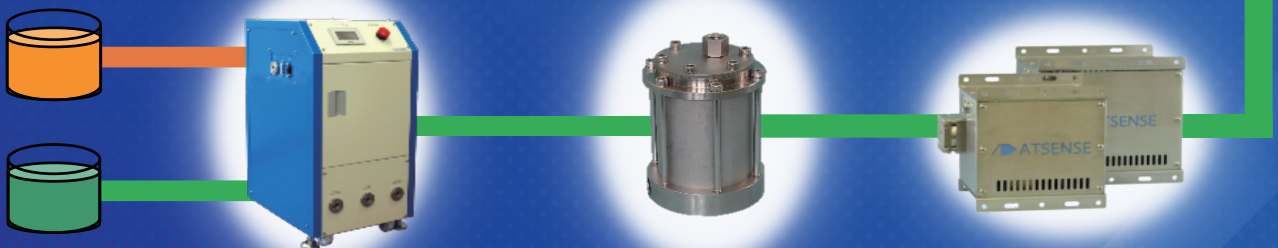


## Generation of rotation angle signals

Ideal for combustion analysis, real drive tests, competitor benchmark tests and conformity assessment tests.



## mixing and flow measurement



- Actual flow measurement in 0.5  $\mu$ L from very low to high flow rates
- Mixing of e-fuel, gasoline, diesel and alcohol



# ATSENSE, Inc.

Akiyama bldg., 6-10 Nishigokencyo, Shinjuku-ku, Tokyo 162-0812, JAPAN  
E-mails: [sales@atsense.jp](mailto:sales@atsense.jp)







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# Awards & Closing Ceremony

**Date:** Thursday, November 3  
**Time:** 11:30 - 12:30  
**Place:** Exhibition Hall C, 1F

The ceremony will begin by the conference summary, and the announcement of the each prize awardees will follow.

## The Summary of the Conference

A representative of JSAE will announce the summary at the beginning of the ceremony.

## Awards

Awardees will be announced and given certificates in recognition of:

- **High Quality Paper Awards** 10 papers
- **The Best Paper Award** One out of the 10 High Quality Papers
- **High Quality Presentation Awards** 5 Presenting authors
- **The Best Poster Award** 1 poster
- **The Best Collegiate Event Award** 1 paper

## Announcement & Introduction of SETC2023

A representative of SAE International will announce and introduce the next SETC to be held in the USA.

## Farewell Remarks

A representative of JSAE will make farewell remarks at the end of the ceremony.



# Technical Sessions

( As of Apr 27, 2022 )

Tentative session timetable will be available in mid-September, 2022 from the following website.  
<https://www.setc-jsae.com/>

**Note:** Papers published in the program may be rejected depending on the reviewed results.

## Advanced Combustion

Organizers: Koji Yoshida (Nihon University), Akira Iijima (Nihon University), Tatsuya Kuboyama (Chiba University), Simona Silvia Merola (Consiglio Nazionale delle Ricerche)

20229007	<b>Effect of Oil Additives and Fuel Concentration in Lubricating Oil on Abnormal Combustion of Supercharged SI Engine</b> Yota Nakayama, Junya Tanaka (Kogakuin University)
20229008	<b>Autoignition of Lubricating Oil from Piston Crown on Abnormal Combustion of Supercharged SI Engine</b> Akira Seto, Yuka Kuwae, Junya Tanaka (Kogakuin University)
20229015	<b>Study on Influence of tailored In-cylinder Flow on HCCI Combustion in a Rapid Compression and Expansion Machin</b> yiwen Zhong, Tatsuya Kuboyama, Yasuo Moriyoshi (Chiba University), Kei Yoshimura (Suzuki Motor Corporation)
20229027	<b>Hot Surface Assisted Compression Ignition (HSACI) as an Approach to Extend the Operating Limits of a Natural Gas Fueled HCCI Engine</b> Joern Alexander Judith, Maurice Kettner (Karlsruhe University of Applied Sciences), Danny Schwarz, Markus Klaissle (SenerTec Kraft-Waerme-Energiesysteme GmbH), Thomas Koch (Karlsruhe Institute of Technology)
20229033	<b>Numerical and Experimental Pre-investigations on Reactive Exhaust Gas Recirculation for a Naturally Aspirated Cogeneration Gas Engine</b> Youssef Beltaifa, Maurice Kettner (Karlsruhe University of Applied Sciences), Peter Eilts (Technical University of Braunschweig) , Bosse Ruchel (WJ Power GmbH)
20229038	<b>Numerical and Experimental Analysis of Abnormal Combustion in a SI Gasoline Engine with a Flat Cylinder Head and a Re-Entrant Piston Bowl</b> Ayano Matsuoka, Kentaro Shiraishi, Shinji Kishi (Kubota Corporation), Jaeok Bae, Makoto Kaneko, Tatsuya Kuboyama, Yasuo Moriyoshi (Chiba University)
20229043	<b>Combustion Performance of Hydrogen Addition in Natural Gas under lean-burn Conditions</b> Hongliang LUO (Hiroshima University)
20229044	<b>Analysis of Cylinder to Cylinder Variations in a Turbocharged Spark Ignition Engine at lean burn operations</b> Ryo Yamaizumi, Haoyun Shi , Tatsuya Kuboyama, Yasuo Moriyoshi (Chiba University)
20229051	<b>Extension of the Lean Limit of Gasoline Engines Under Part Load by Using Hot Surface Assisted Spark Ignition (HSASI)</b> Sascha Holzberger, Maurice Kettner (Karlsruhe University of Applied Sciences) , Roland Kirchberger (Graz University of Technology)

# Technical Sessions

## Advanced Combustion (Continued)

20229060	<b>Experimental quantification of the variation of heat released to the cooling system in a 4-stroke engine equipped with a passive combustion prechamber</b> Luca Romani, Lorenzo Bosi, Francesco Balduzzi , Sandro Raspanti , Marco Ciampolini, Giovanni Ferrara (Università degli studi di Firenze)
20229070	<b>Effects of ignition timing and fuel chemical composition on auto-ignition behavior and knocking characteristics under lean conditions</b> Kaede Shirane, Toshiki Kimura, Sota Nakamura (Nihon University) , Akira Iijima, Karin Furusyo (Nihon University)
20229081	<b>Use of Narrow Angle Split Injection Strategy for Improving The Performance of a Biogas-Diesel RCCI Engine</b> Anirudh Koya, Gopa Kumar S, Ramesh A (IIT Madras)
20229089	<b>Chemical Kinetic Analysis with Two-Zone Model on Spark Knock Suppression Effects with Hydrogen Addition at Low and High Engine Speeds</b> Jun Goto , Minoru Yamamoto (Yamaha Motor Co., Ltd.) , Yoshimitsu Kobashi, Yoshito Ueno, Gen Shibata, Hideyuki Ogawa (Hokkaido University)
20229095	<b>Improvements of Combustion and Emissions in a Natural Gas Fueled Engine with Hydrogen Enrichment and Optimized Injection Timings of Diesel Fuel</b> Yoshimitsu Kobashi , Ryuya Inagaki , Gen Shibata , Hideyuki Ogawa (Hokkaido University)

( As of Apr 27, 2022 )

## Renewable Energy and Alternative Fuels

Organizers: Toru Nakazono (Yanmar Co Ltd), Yuji Araki (Yamaha Motor Co., Ltd.), Paul Richards (Consultant)

20229001	<b>CO2 and H2 effects on lean limits and combustion characteristics of ethanol flame</b> MZ Akram (Tsinghua University)
20229021	<b>Impacts of methanol blended fuels on emissions and operating performance of two-wheelers</b> Guilherme Pellizzaro Batalha (Graz University of Technology )
20229023	<b>Effects of different prechamber spark plug geometries on combustion anomalies of an internal combustion engine</b> Sebastian Oswald Söhnlein, Marco Taschek (Ostbayerische Technische Hochschule Amberg-Weiden), Jörn Alexander Judith, Sascha Holzberger, Maurice Kettner (Karlsruhe University of Applied Sciences)
20229061	<b>Impact of Zero CO2 Fuels on Engine Behaviour of Two-Stroke Engines in Hand-Held Powertools</b> Dominik Gschanes (Institut for Thermodynamics and Propulsion Systems)
20229067	<b>Optimization of the Operating Strategy of a Dual-Fuel Engine Using POMDME as a Pilot Fuel</b> Ann-Kathrin Jost (Technichal University of Kaiserslautern)
20229073	<b>Effect of Blended Fuel of Hydrotreated Vegetable Oil and Fatty Acid Methyl Ester on Spray and Combustion Characteristics</b> Shoi Koshikawa , Eriko Matsumura, Jiro Senda (Doshisha University)
20229074	<b>E-Fuel applications in Non Road Mobile Machinery</b> Armin Kölmel , Christoph Hiller von Gaertringen, René Schwerin, Stefan Schweiger, Holger Lochmann (ANDREAS STIHL AG & Co. KG), Stephan Schmidt, Christian Zinner, Dominik Gschanes, Roland Kirchberger, Helmut Eichlseder (TU Graz University of Technology)

# Technical Sessions

## Renewable Energy and Alternative Fuels (Continued)

20229083	<b>A Study of Autoignition and Combustion Characteristics in an HCCI Engine using a Blended Fuel of DME and City Gas</b> Yusuke Manabe, Shinji Mito, Akira Iijima (Nihon University), Shintaro Yoshihara, Takahiro Yamaguchi, Sekai Miyamoto (Kawasaki Heavy Industries, Ltd)
20229084	<b>Effect of Gaseous Fuels with Different Carbon Numbers on Autoignition Properties</b> Shinji Mito, Yusuke Manabe, Akira Iijima (Nihon University), Shintaro Yoshihara, Takahiro Yamaguchi, Sekai Miyamoto (Kawasaki Heavy Industries, Ltd.)
20229088	<b>Verification of New Hydrogen Refueling Method for Fuel Cell Motorcycle</b> Fumiaki Baba, Takeru Wakiya, Toru Ota (Suzuki Motor Corporation)
20229092	<b>Effect of Different Fuel Supply System on Combustion Characteristics in Hydrogen SI Engine</b> Shoi Koshikawa, Yuki Matsuya, Tsukasa Sekine, Eriko Matsumura, Jiro Senda (Doshisha University), Gin Morita, Toru Nakazono (Yanmar Holdings Co., Ltd.)

( As of Apr 27, 2022 )

## Diesel Engine

Organizers: Tadao Okazaki (Kubota Corporation), Paul Litke (Air Force Research Laboratory)

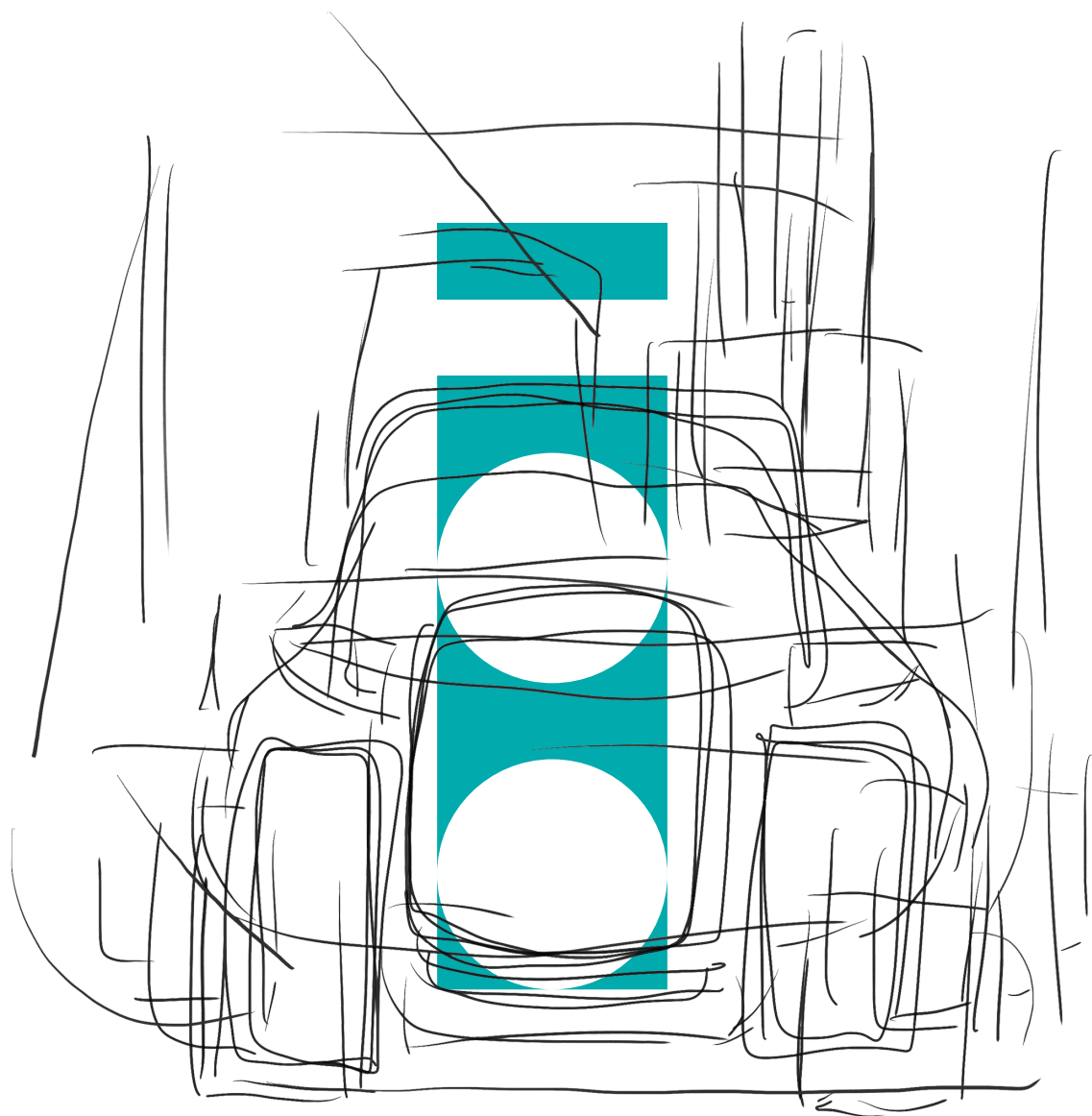
20229013	<b>Effect of Pilot Injection on Improvement of Fuel Consumption and Exhaust Emissions of IDI Diesel Engines</b> Yoshiyuki Kidoguchi, Yuzuru Nada, Tatsuya Ichikawa, Haruto Miyoshi, Kazuhiro Sakai (Tokushima University)
20229052	<b>Development of 1.5L direct injection diesel engine with common rail system in compliance with EU StageV</b> Shoichi Okimi, Kentaro Nagai, Reo Yoshida, Tomoya Akitomo, Takahiro Yamazaki (Kubota Corporation)
20229068	<b>Studies on Spray and Combustion Characteristics of Throttle Type Nozzle Used in a Swirl-Chamber Diesel Engine</b> Zenta Sudo, Yuma Hozen, Beini Zhou, Jin Kusaka (Waseda University), Kenya Ajiro (Mitsubishi Heavy Industries Engine & Turbocharger, Ltd.), Tomohiro Koga (Mitsubishi Heavy Industries, Ltd.)

( As of Apr 27, 2022 )

## Emission and Environmental Impacts

Organizers: Takashi Mitome (Suzuki Motor Corporation), Tadao Okazaki (Kubota Corporation), Leonid Tartakovsky (Technion – Israel Institute of Technology)

20229004	<b>Impact of 3-way catalytic converters on particulate emission of MPFI motorcycle engines</b> Sebastian Schurl (Graz University of Technology)
20229005	<b>Design and Implementation of An Oxidation Catalyst For A Spark Ignited Two Stroke Snowmobile Engine</b> Noah Robert Squires, Scott Miers (Michigan technological University)
20229019	<b>Research for “Trap Catalyst” located on upper stream of main catalyst for suppressing the catalyst deterioration of internal combustion engine</b> Daisuke Matsukawa, Kiichi Shimamura, Akihito Kasai, Shuto Sato (Honda R&D Co., Ltd.)
20229026	<b>Carbon Footprint Calculation of Catalytic Converter Production – An Industrial Case Study</b> Simon Merschak, Peter Hehenberger (University of Applied Sciences Upper Austria), Marcus Bonifer (Heraeus Deutschland GmbH & Co. KG)



Kubota Engine 100th Anniversary





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# Technical Sessions

## Emission and Environmental Impacts (Continued)

20229036	<b>Evaluation of the applicability for an exhaust gas catalyst for motorcycles made of Rh alternative alloy materials</b> Takuya Motegi, Natsuki Ako, Shunya Tatara, Kosuke Doi (Yamaha Motor Co., Ltd.)
20229047	<b>Effects of Partial-Flow Diesel Particulate Filter on Diesel Engine Combustion and Particle Emissions Characteristics</b> Myat Hsu Thin, Preechar Karin (King Mongkut' s Institute of Technology), Peerawat Saisirirat (National Metal and Materials Technology Center), Hidenori Kosaka(Tokyo Institute of Technology), Watcharin Po-ngen (King Mongkut' s University Of Technology North Bangkok)
20229050	<b>Development of DPF regeneration system under all operating conditions for generators</b> Daichi Kato (Kubota Corporation)
20229091	<b>Observation of spray behaviors in a pipe at lower temperature for Urea-SCR system</b> Naoki Sugiyama (Tokai University)

( As of Apr 27, 2022 )

## Engine Components and Fuel Supply Systems

Organizers: Wataru Yamamoto (Kawasaki Motors, Ltd.), Tatsuya Kuboyama (Chiba University), Ken Fosaaen (Kerdea Technologies)

20229035	<b>A Novel Direct Gaseous Reformate Injector – Design and Experimental Study</b> Asher Netzer-Lichinitzer, Leonid Tartakovsky (Technion – Israel Institute of Technology)
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( As of Apr 27, 2022 )

## Powertrain Controls

Organizers: Shigeho Sakoda (Yamaha Motor Co., Ltd.), Mikael Bergman (Husqvarna AB)

20229009	<b>Wasted spark duration measurement as a method for firing TDC identification in small engines</b> Adrian Irimescu , Simona Silvia Merola (Consiglio Nazionale delle Ricerche), Giovanni Cecere (CNR STEMS)
20229048	<b>Increased Reliability and Usability through the Introduction of a User Interface Module for Hand-Held Small Engines</b> Bahattin Öztürk (PRÜFREX Engineering e Motion GmbH & Co.KG)
20229058	<b>Control-Oriented Engine Model for Online Fuel Identification</b> Simon Mayr, Gernot Grabmair (University of Applied Sciences Upper Austria )

# Technical Sessions

( As of Apr 27, 2022 )

## Engine Technology

Organizers: Ken'ichi Ohmori (Honda R&D Co., Ltd.), Masahito Saito (Kawasaki Heavy Industries, Ltd.), Arun Ravindran (Cummins, Inc.)

20229006	<b>Distribution of Friction and Moment of Inertia in Start of SI Engine</b> Naoki Miyaoka , Hirotaka Sato, Masato Shimizu, Junya Tanaka (Kogakuin University)
20229017	<b>Effects of Engine Cooling System on Engine Performance: Balancing Engine Power and Fuel Consumption</b> Yota Sakurai , Yoshinori Nakao, Atsushi Hisano (Kawasaki Heavy Industries, Ltd.), Kunihiro Tanaka, Michihisa Nakagawa (Kawasaki Motors, Ltd.)
20229028	<b>Development of a Rotary Valve Engine for Handheld Equipment</b> Norman H. Garrett , Mesbah Uddin (University of North Carolina - Charlotte), Mikael Bergman, Garrett Purvis (Husqvarna AB), Darrick Vaseleniuck, Dan Cordier (Vaztec)
20229055	<b>Establishing a methodical approach to validate and improve the fuel economy of small capacity two-wheelers powered by internal combustion engines</b> Juergen Tromayer, Martin Steyskall, Thomas Koenigshofer, Alexander Hagenberger (Graz University of Technology)
20229079	<b>Feasibility study of boosted DI technology for sport motorcycle</b> Hayatoshi Sato, Masaki Torigoshi (Yamaha Motor Co., Ltd.)
20229093	<b>Design and Development of Variable Length Intake Manifold for Small Bore Engines</b> Jerome Stanley Martin (SRM Institute of Science and Technology)

( As of Apr 27, 2022 )

## Hybrid and Electric Drives

Organizers: Yasuyuki Muramatsu (Yamaha Motor Co., Ltd.), Ken' ichi Ohmori (Honda R&D Co., Ltd.), Kai W. Beck (Andreas Stihl AG & Co. KG)

20229002	<b>Development of Smart Drive 48V e-Motorcycle</b> Hubert FRIEDL, Christian HUBMANN, Bernhard GRAF, Patrick FALK (AVL List Austria)
20229018	<b>Efficiency Increase of a Conventional ICE Powertrain with CVT by 48V-Hybridization with Focus on L-Category Powersport Applications</b> Alexander Hagenberger (Graz University of Technology)
20229025	<b>Investigation on transient behavior and SoC balancing of a hybrid powertrain hand-held tool</b> Dimitrios Vogiatzis (Graz University of Technology)
20229059	<b>Technical Evaluation of Energy Requirements for hybrid powertrains for high performance motorcycles</b> Balagovind Nandakumar Kartha, Qing Peng, Tatsuki Sugaya, Shinya Takasawa (Bosch Corporation)
20229085	<b>Effect of Insulating Varnish Impregnation Range of Motor on Vibration Characteristics</b> Yoshisada Sakamoto, Mihiro Nakanishi, Motoki Hirano, Yoshiyuki Terada (Suzuki Motor Corporation)



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# Technical Sessions

## Hybrid and Electric Drives (Continued)

20229090	<b>Energy Management in Hybrid Electric Powertrain by Implementation of Supervised Machine Learning Algorithms</b> Pranay Nirapure, Mayank Mittal, Pradeep Menon (Indian Institute of Technology, Madras), Kanupriya Mittal (Anna University)
20229094	<b>Suboptimal Online Energy Management for a Fuel Cell/Supercapacitor/Battery Electric Vehicle Using Artificial Neural Network Approach</b> CHEN Chien Liang, HUNG Yi Hsuan, QIU Zhu Yang (National Taiwan Normal University)

( As of Apr 27, 2022 )

## Lubricants and Tribology

Organizers: Yuji Mihara (Tokyo City University), Jason Hanthorn (The Lubrizol Corporation)

20229066	<b>Towards Efficient and Sustainable Small Engine Lubricants</b> Jason Hanthorn , Yvonne Koay (The Lubrizol Corporation)
20229071	<b>Tribological performance of palm oil blended with hexagonal boron nitride nanoparticles as an environment-friendly lubricant</b> Mohd Fadzli bin Abdollah , Hilmi Amiruddin (Universiti Teknikal Malaysia Melaka)
20229072	<b>Lubrication mechanisms of hexagonal boron nitride nano-additives water-based lubricant for steel-steel contact</b> Hilmi Bin Amiruddin, Mohd Fadzli Bin Abdollah (Universiti Teknikal Malaysia Melaka)
20229077	<b>Development of Low-Friction Pistons for Small Scooter Engines</b> Shinya Kubota , Yoshinari Ninomiya, Naoyuki Suda(Suzuki Motor Corporation)

( As of Apr 27, 2022 )

## Materials and Manufacturing

Organizers: Hirotaka Kurita (Yamaha Motor Co., Ltd.), Ch. V. Hiller (Andreas Stihl AG & Co. KG)

20229010	<b>Development of Resin Coated Piston suitable for Monolithic Cylinders made of Hypereutectic Al-Si Alloy</b> Keita Watanabe, Hirotaka Kurita (Yamaha Motor Co., Ltd.)
20229024	<b>Development of 1520 MPa higher fatigue strength light weight suspension spring</b> Hideki Kato, Shinji Kasatori (Honda Motor Co., Ltd.), Hirokatsu Kameda (Hitachi Astemo, Ltd), Shoichi Suzuki (NIPPON STEEL SG WIRE CO., LTD)
20229041	<b>Silver surface treatment applicable to bolts for motorcycles</b> Hiroshi Hirayama (Honda Motor Co., Ltd.), Manabu Inoue, Takeshi Koike (DIPSOL CHEMICALS CO., LTD)
20229042	<b>Structural optimisation of motorcycle top bridges</b> Riku Mitsui (Yamaha Motor Co., Ltd.)
20229075	<b>Effect of bonding conditions on the bonding of wear-resistant steel and aluminum castings</b> Takaharu Suzuki, Hisashi Harada (Yamaha Motor Co., Ltd.)
20229078	<b>Stiffness optimization process using topology optimization techniques and lattice structures</b> Hiroyuki Nagamoto (Yamaha Motor Co., Ltd.)

# Technical Sessions

( As of Apr 27, 2022 )

## Measurement and Simulation

Organizers: Tadao Okazaki (Kubota Corporation), Gaku Naoe (Honda R&D Co., Ltd.), Jun Ishikawa (Honda Motor Co., Ltd.), Stephan Schmidt (Graz University of Technology)

20229011	<b>Prediction of Fatigue Strength of Motorcycle Exhaust System in Higher Temperature Range</b> Takanori Nagata (Honda Motor Co., Ltd.)
20229014	<b>Application of AI for Predicting Test Cycles of Drivetrain Component</b> Gaurav Sirsaj (Dana India), Vinay Vilas Kharche (Dana India Technical Center)
20229031	<b>An estimation method of blended fuel contents by data assimilation for carbon neutral powertrain</b> Naoki Yoneya (Hitachi, Ltd.), Kenji Amaya (Tokyo Institute of Technology)
20229045	<b>Measurement of propagating flame in a gasoline engine under transient operating conditions using a multiple-ion probe</b> Tomoaki Yatsufusa, Yuki Goto (Hiroshima Institute of Technology),
20229046	<b>Development of Simulation Model for Estimating Loads Applied to Scooter Frame when Traveling on Rough Roads</b> Tetsuharu Maruyama, Shinya Takahashi (Honda Motor Co., Ltd.)
20229053	<b>Local change of PV value on end faces of rocker pins of chain type CVT (Continuously Variable Transmission) under transmitting condition</b> Ryunosuke Kikui (Graduate school of Doshisha University), Kazuya Okubo, Kiyotaka Obunai (Doshisha University)
20229065	<b>Crankshaft Dynamics and Durability Analysis</b> Aju Joseph, S Karthik (Royal Enfield)
20229113	<b>CFD analysis of a port fuel injection IC engine to study mixture preparation and combustion and its impact on raw emissions</b> Manish Garg, Arivazhagan GB (TVS Motor Company)

( As of Apr 27, 2022 )

## NVH Technology

Organizers: Gaku Naoe (Honda Motor Co., Ltd.), Keisuke Namekawa (Suzuki Motor Corporation), Thomas Lagö (QirraSound Technologies Europe AB)

20229016	<b>Development of Light-weight, Low-noise Exhaust Muffler Using the Laminated Structure for the Muffler Outer Shell</b> Junichiro Suzuki, Yuji Kurasawa, Satoru Maki, Kazuyuki Oda (Honda Motor Co., Ltd.)
20229037	<b>Application of Participation Factor Focusing on Response at Specific Part for Vibration Evaluation of Motorcycle Frame</b> Masashi Michiue, Takeyuki Sakai (Kawasaki Heavy Industries, Ltd.), Manabu Morikawa, Naoki Arino (Kawasaki Motors, Ltd.)
20229056	<b>Novel 3D Printed Exhaust Silencer for Small Engine Noise Control Applications</b> Margus Villau , Hans Rämmlal, Jüri Lavrentjev (Tallinn University of Technology)
20229064	<b>Sound Quality, Pass-by Noise, Exhaust Emissions, Performance, Rideability - How to best balance these attributes?</b> Bernhard Johann Graf , Andrea Greco, Markus Resch, Christian Hubmann (AVL List GmbH)

## 内燃機関熱予測ソリューション

# Ricardo FEARCE-Vulcan

エンジン性能データと形状を用いた、外表面の熱伝達計算のためのツールです。熱力学プロパティ、形状、筒内の状態から計算した数学モデルと物理的相関に基づいた境界条件をベースに、高精度な熱予測を行います。

### VULCANの特徴

■ 熱予測の高速計算(数分で完了)

■ 主要部品のサンプルモデルを用意、解析に利用可能

### ■ 独自の解析手法

- Ricardo独自の理論モデルと準経験的手法の組み合わせ
- 境界条件温度の反復計算
- 全ての熱伝達経路の詳細把握解析

## 内燃機関の熱問題を高速・高精度に予測解析

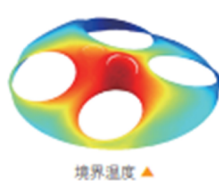
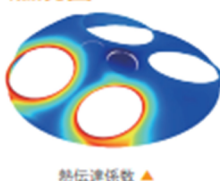
### 燃焼時の燃焼ガス伝播に基づくピストンクラウン、燃焼面の境界条件

排気プロセスにおけるエキゾーストバルブ経由のガス流れを考慮

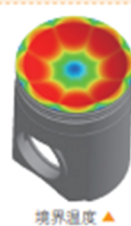
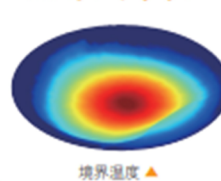
#### 影響因子

- ボウル形状
- 点火プラグ位置
- インジェクター位置 / ノズル

#### 燃焼面



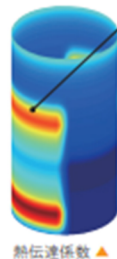
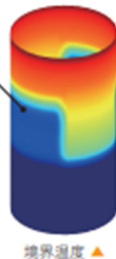
#### ピストンクラウン



### FE(有限要素)モデルへの境界条件マッピング

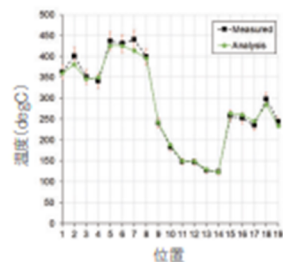
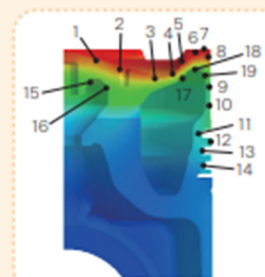
#### ライナー

スカートによる冷却



ピストン上下切り返し時のスカート位置の熱伝達係数上昇

### 計測データとの高い相関



## ■ お問い合わせ先

**SCSK** SCSK株式会社

〒135-8110 東京都江東区豊洲3-2-20 豊洲フロント  
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## New Hydrogen Analyzer HyEVO

High-accuracy, high-resolution hydrogen gas analyzer designed to support the development of the hydrogen supply chain

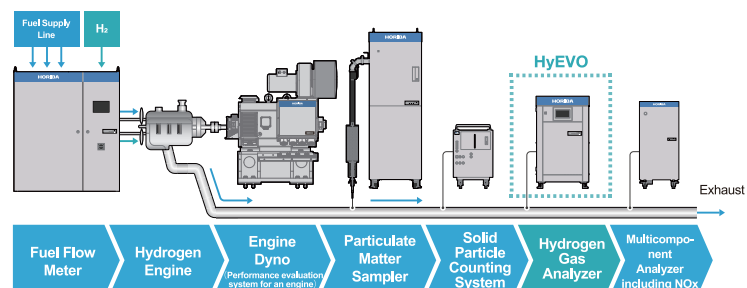
Essential for the development of technologies necessary to produce, transport and use hydrogen and hydrogen related materials such as ammonia.

### Hydrogen Measurement Applications

Field	Application example
Environment / Energy	<ul style="list-style-type: none"> <li>Hydrogen combustion in hydrogen gas turbines, hydrogen boilers</li> <li>Hydrogen production through water electrolysis</li> <li>Development of fuel cells as power generation devices</li> <li>Production of synthetic fuels made from hydrogen and carbon dioxide</li> </ul>
Mobility	Hydrogen measurement for fuel cells, hydrogen engines, gasoline engines
Medical	Measurement of hydrogen in exhaled air for health monitoring



**NEW**





# Technical Sessions

( As of Apr 27, 2022 )

## Two Stroke Engine

Organizers: Akira Iijima (Nihon University), Giovanni Ferrara (Università degli Studi di Firenze)

20229012	<b>Experimental Analysis of a Uniflow Scavenged Two-Stroke Concept</b> Stefan Sturm (Graz University of Technology)
20229032	<b>Emissions and Performance Impact of E20 on a Two-stroke Engine</b> Scott A. Miers , Brian J Eggart (Michigan Technological University), John G. Loesche (General Motors)
20229057	<b>On the Potential of Transfer Port Injection Strategies for a Two-Stroke Engine</b> Francesco Balduzzi, Luca Romani, Giovanni Ferrara (Università degli Studi di Firenze)
20229063	<b>Describing the Auto-Ignition Quality in Small, Air Cooled, Two Stroke Engines</b> Per Risberg, Thomas Elm, Fredrik Hellquist, Mikael Bergman (Husqvarna Group), Anna Karvo, Rupali Tripathi (Neste Oyj)
20229076	<b>Study of Pre-chamber Jet Combustion Behavior using a Small Two-stroke Optically Accessible Engine</b> Takato Deushi, Takuma Naka, Tatsuya Tsujiguchi (Graduate School of Science and Technology, Nihon University), Akira Iijima (College of Science and Technology, Nihon University), Shiro Yamaguchi, Minoru Kuroiwa, Kuniyoshi Eto (YAMABIKO Corporation)
20229080	<b>Numerical Investigation of the Effect of Engine Speed and Delivery Ratio on High Speed Knock in a Small Two-stroke SI Engine</b> Kuniyoshi Eto, Tatsuya Kuboyama, Yasuo Moriyoshi (Graduate School of Science and Engineering, Chiba University), Toshio Yamada (Engineer, Sustainable Engine Research Center Co., Ltd.)

( As of Apr 27, 2022 )

## Vehicle Dynamics and Safety

Organizers: Jun Ishikawa (Honda Motor Co., Ltd.), Hisayuki Sugita (Suzuki Motor Corporation), Justin Magri (Robert Bosch LLC)

20229003	<b>Application of a Road Simulator to Efficient Fatigue Reliability Evaluation of an Off-road Motorcycle</b> Hideki Makida (Kawasaki Motors, Ltd.)
20229029	<b>Development of evaluation technology for motorcycle advanced rider assistance systems</b> Shohei Hosokawa, Kazuya Nagasaka (Kawasaki Heavy Industries, Ltd.), Hiroyuki Watanabe (Kawasaki Motors, Ltd.)
20229030	<b>A Tire Model to estimate Influence of Tire Rolling Resistance on the Efficiency of Motorcycles</b> Barath Mohan (TVS Motor Company Ltd)
20229039	<b>Development of Tire Force Estimation Logic for Off-road Four-wheelers</b> Taichi Inaba, Takenori Terada, Atsushi Sano (Kawasaki Heavy Industries, Ltd.), Hideyuki Kato (Kawasaki Motors, Ltd.)
20229062	<b>Novel Sensor based Real Time Road Profile Estimation using Machine Learning in Two-Wheelers</b> Barath Mohan (TVS Motor Company Ltd)

# Technical Sessions

## Vehicle Dynamics and Safety (Continued)

20229069	<b>Chassis development of Motorcycle with integrated aerodynamic devices.</b> Tomo Yamamoto (Kawasaki Motors, Ltd.)
20229082	<b>Study of off-road motorcycle behavior in motocross and cross-country</b> Yuki Uto, Shinichi Inoue (Kawasaki Motors, Ltd.), Kazuto Yano (K-TEC Corporation)
20229086	<b>One Systematic Design Method and Control Performance Evaluation of Heading Control System in Pleasure Boats</b> Naoki Imamura, Ryo Sakaguchi (Mitsubishi Electric Corporation)
20229112	<b>Simulation Driven Aerodynamic Development of a High Performance Motorcycle</b> Manish Garg (TVS Motor Company)

# About Himeji -1-

## Himeji

Himeji is located at the center of the Harima Plain in the southwestern part of Hyogo Prefecture. Surrounded by mountains and the Seto Inland sea. Himeji has developed as a transportation hub of western Japan. Blessed with a mild climate and natural beauty, the city has realized excellent cultural characteristics through its long history as a castle town. Since Himeji became a city in April 1889, its population has increased together with expansion of the city area, and now currently exceeds 540,000, including more than 10,000 international residents. While evolving as a center for economics, culture and education in the Harima region, the city now comprises a large economic and cultural block in the region.

### Himeji Castle -World Heritage-

In 1993 Himeji Castle was designated as Japan's first World Cultural Heritage site. It is the finest surviving example of early 17th-century Japanese castle architecture, comprising 83 buildings with highly developed systems of defense and ingenious protection devices dating from the beginning of the Shogun period. It is a masterpiece of construction in wood, combining function with aesthetic appeal, both in its elegant appearance unified by the white plastered earthen walls and in the subtlety of the relationships between the building masses and the multiple roof layers. The castle is also called Shirasagi-jo (White Egret Castle) because of its beautiful white exterior.

#### TOURIST SPOT



#### TOURIST SPOT



### Koko-en Garden

Kokoen, the Nishi-Oyashiki-ato garden, opened in 1992 and shares the landscape with the World Cultural Heritage Himeji Castle. It is a traditional round-the-pond style Japanese garden, designed to make the best use of the layout of the Nishi-Oyashiki-ato, former samurai residences and paths discovered by archeological excavation. Each time you pass through a gate or cross a moat, one of the nine different gardens presents itself. It is a popular location for shooting historical Japanese dramas. Sojuan teahouse in the Tea Garden, built in the sukiya architectural style, offers matcha tea for ¥500 per person.



# About Himeji -2-

## Shoshazan Engyoji Temple

Shoshazan Engyoji Temple is an ancient Tendai sect temple, established by the priest Shoku in 966. The complex of buildings is at the top of Mt. Shosha approximately 25 minutes by bus from Himeji Station. The mountain summit can be reached by either a one-mile hiking trail or Mt. Shosha Ropeway, and it is often visited by pilgrims. Scenes from The Last Samurai were filmed here.

## TOURIST SPOT



## TOURIST SPOT



## Nearby islands

The Ieshima are a collection of 44 islands just off the coast of Himeji City in the Seto Inland Sea. Of the islands, just four are large enough to be inhabited, and of these, Ieshima is the largest.

The Ieshima Jukkei is a collection of ten scenic spots that can be found across the islands. Spots include the site of old castle ruins on Ieshima and other Edo-period remains. The islands can be accessed by a ferry from Himeji Port.

## GOURMET

## Himeji Cuisine

There are many local cuisines you can enjoy in Himeji. Try out some "Himeji Oden" with ginger soy sauce and Japanese Sake made by the selected sake-brewing rice such as Yamada Nishiki and Hyogo Yume Nishiki.





# Useful Websites

## ■ Arcrea HIMEJI (Conference Venue)

<https://www.himeji-ccc.jp/en/>

## ■ Hotel Nikko Himeji (Banquet venue)

<https://www.hotelnikkohimeji.co.jp/en/>

## ■ Himeji Convention & Visitors Bureau

<https://www.himeji-kanko.jp.e.adl.hp.transer.com/>

## ■ West Japan Railway Company

<https://www.westjr.co.jp/global/en/>

## ■ Japan Rail Pass

<https://japanrailpass.net/en/>

## ■ VISA Information of Japan

[https://www.mofa.go.jp/j\\_info/visit/visa/index.html](https://www.mofa.go.jp/j_info/visit/visa/index.html)

## ■ Kansai International Airport

<https://www.kansai-airport.or.jp/en/>

## ■ Information related to COVID-19 in Japan

[https://www.isa.go.jp/en/covid-19\\_index.html](https://www.isa.go.jp/en/covid-19_index.html)

# Himeji City Map





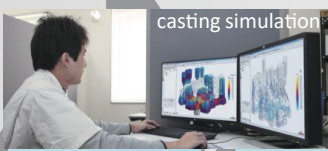
# Solution partners of experimental production



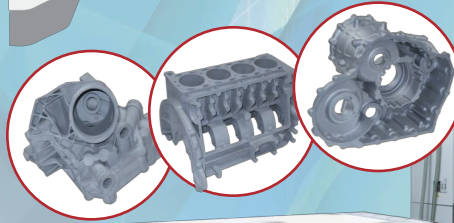
Thailand Factory



Japan Factory



casting simulation



S-MAX  
The new machine



## Casting manufacturer developing prototypes with high quality and short lead-time

We are a casting manufacturer that provides high-quality aluminum sand casting parts. Our main products are trial parts for prototype vehicles (four wheels/two wheels) and engine parts for motor sports vehicles. Our characteristic is integrated manufacturing services: from making wooden mold, casting to precision machining. We have introduced a number of advanced system such as a 3D laminated sand mold printer, casting simulation and a high precision X-ray device to satisfy customer demands for high quality products with short lead-times.

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369-1211, Japan

Thailand Factory : 33/3 Moo4 T. Wangpattana, A. Bangsai, Ayutthaya,  
13270, Thailand

## Memo



## Memo



