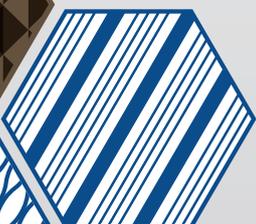
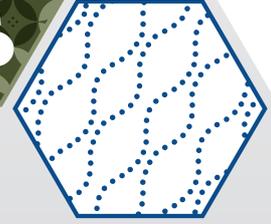


The **26**th

S MALL
POWERTRAINS AND
E NERGY SYSTEMS

T ECHNOLOGY
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



(Blank)

Contents

Program at-a-Glance	2
Introduction of SETC2022	3 - 4
Sponsors & Advertisers	5
Committee Members	6 - 7
Conference Registration	8 - 9
Access to Venue	10 - 11
Venue	12 - 13
Exhibition & Poster Session	14
New Product Technology Session	15
Optional Tours	18
Banquet	19
Keynote Addresses	20
Plenary Session	21 -23
Awards & Closing Ceremony	26
Technical Sessions	27 - 41
About Himeji	42 - 43
Useful Websites	44
Himeji City Map	45

Program at-a-Glance

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

Year	City	Country	Year	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

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)

Sponsors



INTELLIGENCE IN DRIVES

Program Advertisers

- EXEDY Corporation
- HORIBA, Ltd.
- ATSENSE INC.
- Kawasaki Motors, Ltd.
- KUBOTA Corporation
- Yamaha Motor Co., Ltd.
- SUZUKI MOTOR CORPORATION
- Honda Motor Co., Ltd.
- Hokuriku Light Metal Industry
- SCSK Corporation

Technical Exhibitions

- EXEDY Corporation
- dSPACE Japan
- Cambustion
- Kawasaki Motors, Ltd.
- Hexagon
- KUBOTA Corporation
- Honda Motor Co., Ltd.
- ONO SOKKI CO., LTD.
- GS Yuasa Corporation
- KOIWA Co.,Ltd.
- SUZUKI MOTOR CORPORATION
- Yamaha Motor Co., Ltd.
- TOSHIBA CORPORATION
- Reishauer
- Nidec Elesys Corporation
- SCSK Corporation
- TOYO Corporation
- SMT
- Mitsubishi Electric Corporation

Commercial between Sessions

- Kawasaki Motors, Ltd.
- SUZUKI MOTOR CORPORATION
- KUBOTA Corporation
- EXEDY Corporation
- dSPACE Japan
- Honda Motor Co., Ltd.
- Yamaha Motor Co., Ltd.

*Companies name are in random order

In association with Japan Marine Industry Association (JMIA)

Committee Members

JSAE Honorary Committee 2022

Chair Seiichi Kai

Shigeyuki Higashi

Heiji Maruyama

Hideo Shoji

Tsuyoshi Tanaka

Ryushi Tsubota

(Kawasaki Motors, Ltd.)

(Japan Land Engine Manufacturers Association)

(Yamaha Motor Co., Ltd.)

(Nihon University)

(SUZUKI MOTOR CORPORATION)

(Honda Motor Co., Ltd.)

JSAE Organizing Committee 2022

Chair Michihisa Nakagawa

Masaaki Ishibashi

Ryosuke Ishikawa

Tatsuo Kawano

Yuji Kouma

Tatsuya Kuboyama

Naoyoshi Kuragaki

Yohei Kurihara

Hiroataka Kurita

Tadao Okazaki

Shigeo Sano

Takashi Sugiura

Koji Yoshida

(Kawasaki Motors, Ltd.)

(Honda Motor Co., Ltd.)

(SUZUKI MOTOR CORPORATION)

(Kawasaki Motors, Ltd.)

(Kawasaki Motors, Ltd.)

(Chiba University)

(Yamaha Motor Co., Ltd.)

(SUZUKI MOTOR CORPORATION)

(Yamaha Motor Co., Ltd.)

(Japan Land Engine Manufacturers Association/Kubota Corporation)

(Honda R&D Co., Ltd.)

(Honda Motor Co., Ltd.)

(Nihon University)

JSAE Technical Committee 2022

Chair Hiroya Ueda

Yuji Araki

Akira Iijima

Jun Ishikawa

Tatsuya Kuboyama

Yuji Mihara

Takashi Mitome

Toru Nakazono

Keisuke Namekawa

Gaku Naoe

Ken'ichi Ohmori

Tadao Okazaki

Masahito Saito

Shigeho Sakoda

Hisayuki Sugita

Wataru Yamamoto

Koji Yoshida

(Honda Motor Co., Ltd.)

(Yamaha Motor Co., Ltd.)

(Nihon University)

(Honda Motor Co., Ltd.)

(Chiba University)

(Tokyo City University)

(SUZUKI MOTOR CORPORATION)

(Japan Land Engine Manufacturers Association/Yanmar Co., Ltd.)

(SUZUKI MOTOR CORPORATION)

(Honda R&D Co., Ltd.)

(Honda R&D Co., Ltd.)

(Japan Land Engine Manufacturers Association/Kubota Corporation)

(Kawasaki Heavy Industries, Ltd.)

(Yamaha Motor Co., Ltd.)

(SUZUKI MOTOR CORPORATION)

(Kawasaki Motors, Ltd.)

(Nihon University)

Committee Members

JSAE General Committee

Chair Takashi Mitome

Yasuyuki Muramatsu

Michihisa Nakagawa

Tadao Okazaki

Hiroya Ueda

Koji Yoshida

(SUZUKI MOTOR CORPORATION)

(Yamaha Motor Co., Ltd.)

(Kawasaki Motors, Ltd.)

(Japan Land Engine Manufacturers Association/Kubota Corporation)

(Honda Motor Co., Ltd.)

(Nihon University)

SAE Technical Committee 2022

Chair Stephan Schmidt

Kai Beck

Mikael Bergman

Giovanni Ferrara

Ken Fosaaen

Jason Hanthorn

Maurice Kettner

Thomas Lagö

Paul Litke

Justin Magri

Maurizio Marcacci

Simona Merola

Scott Miers

Arun Ravindran

Paul Richards

Leonid Tartakovsky

Jürgen Tromayer

Christopher von Hiller

(Graz University of Technology)

(Andreas Stihl AG & Co. KG)

(Husqvarna AB)

(University of Florence)

(Kerdea Technologies, Inc.)

(The Lubrizol Corporation)

(Karlsruhe University of Applied Sciences)

(QirraSound Technologies Europe AB)

(U.S. Air Force)

(Robert Bosch GmbH)

(Piaggio & C. SpA)

(Institute of Sciences and Technologies for Sustainable Energy and Mobility)

(Michigan Technological University)

(Cummins Inc.)

(Consultant)

(Technion – Israel Institute of Technology)

(Graz University of Technology)

(Andreas Stihl AG & Co. KG)

Conference Registration

Registration Fee

(Tax is included)

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

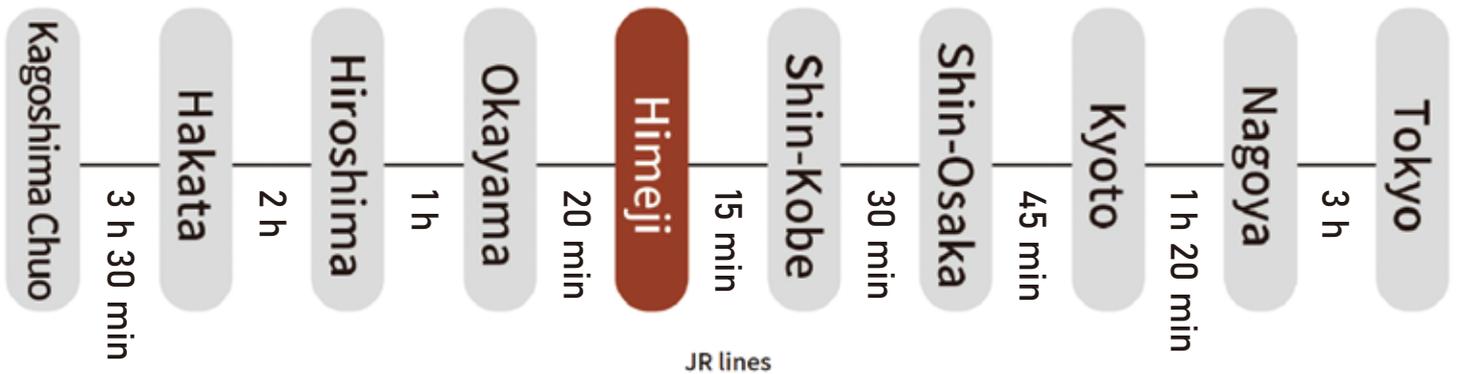
Access to Venue -1-



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.

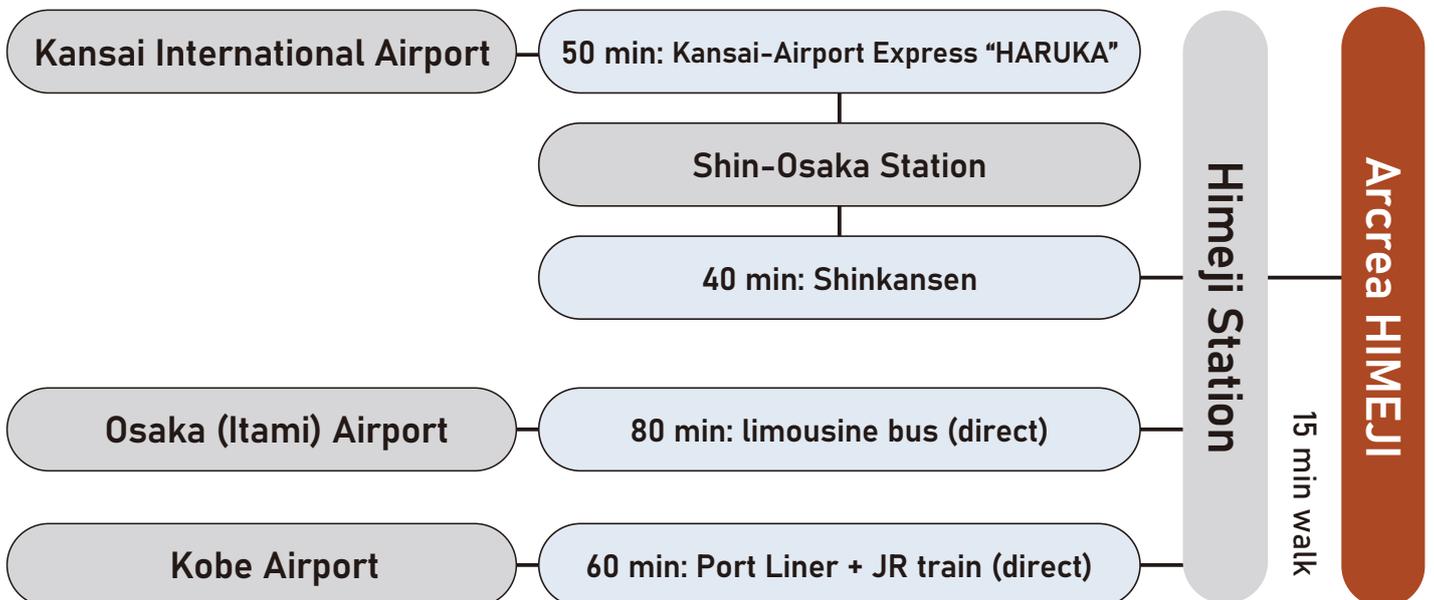


60 min from Osaka

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



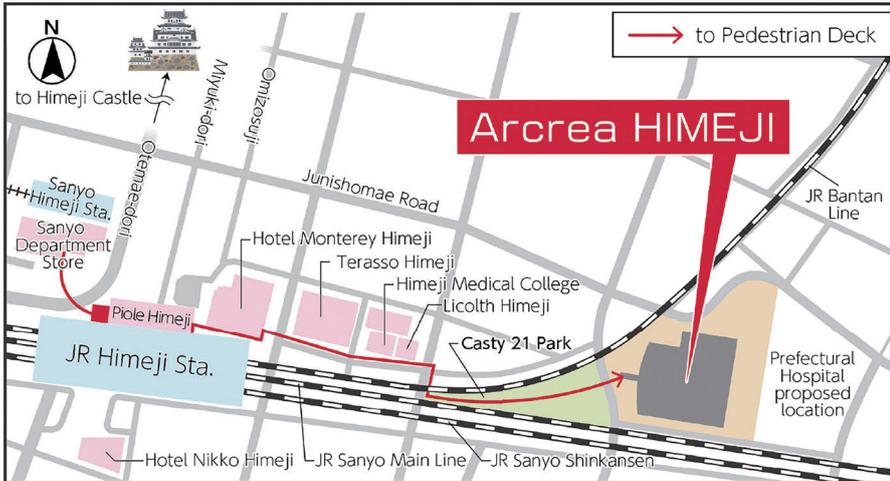
By plane



*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.



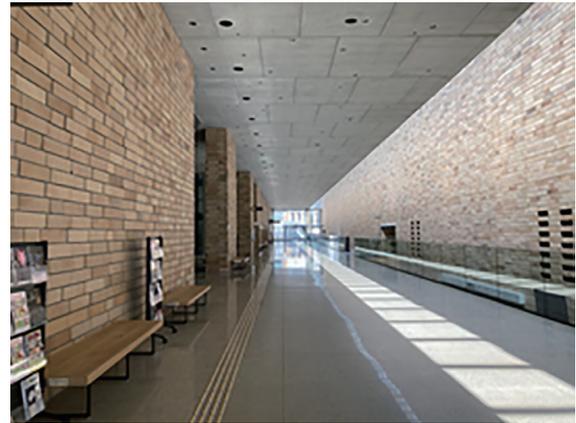
About 15 min walk from Himeji Station

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

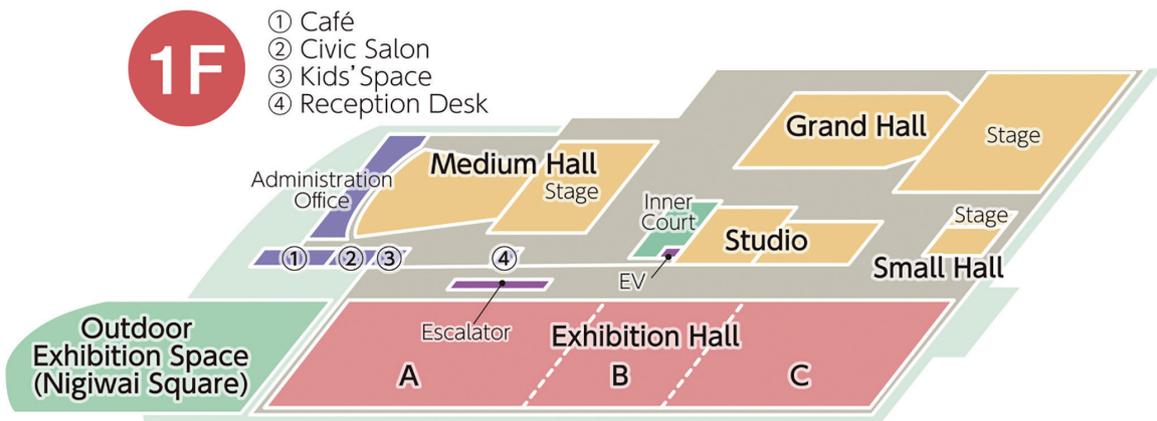
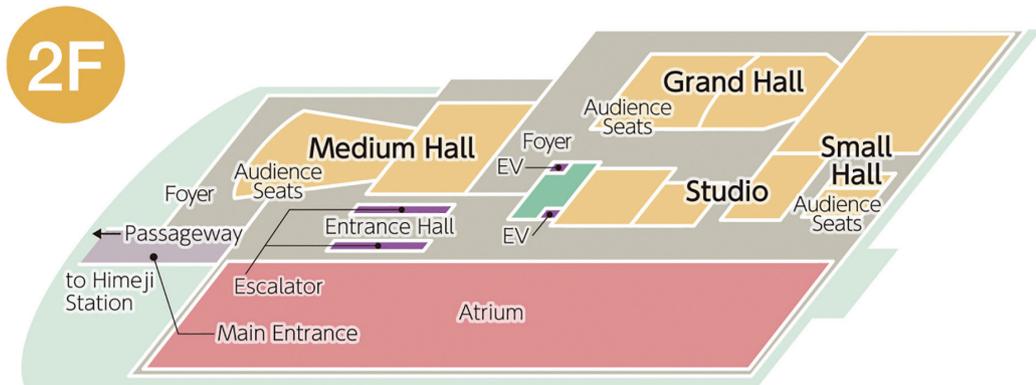
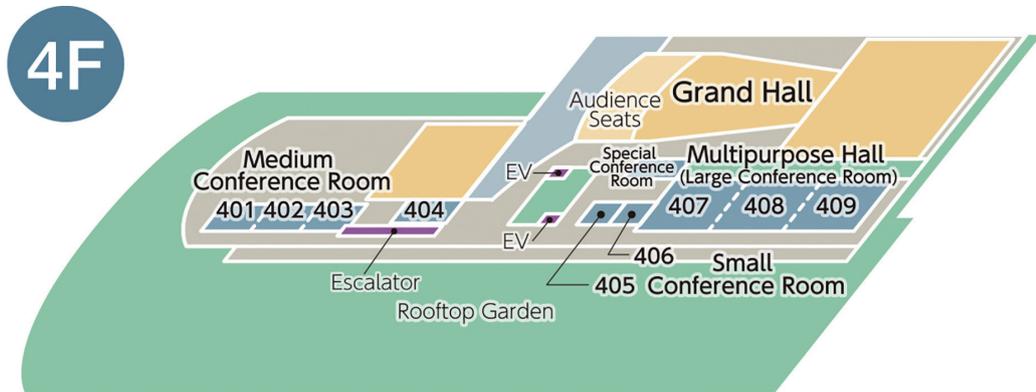


Venue

Arcrea HIMEJI (Himeji Culture and Convention Center)

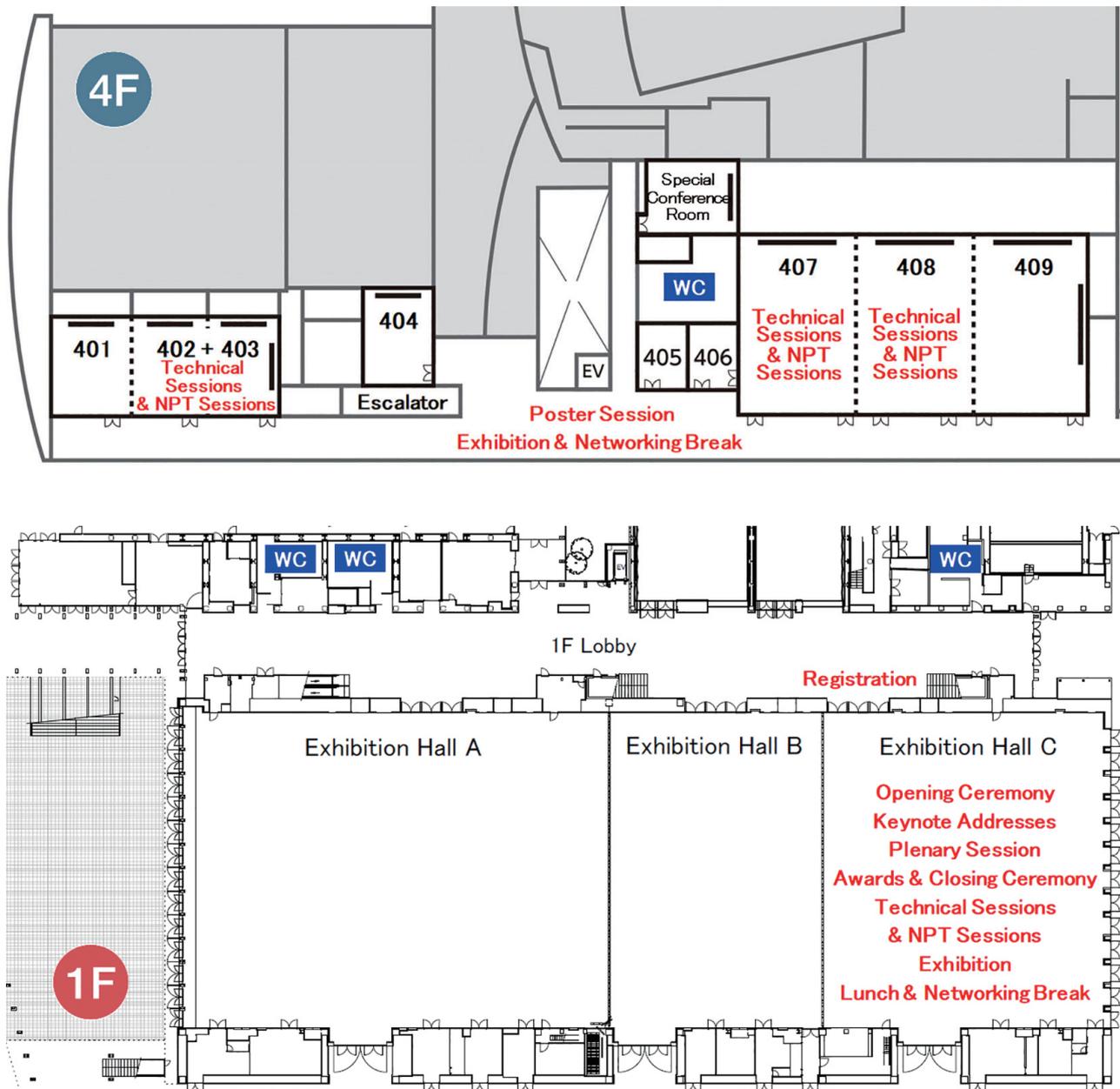


Exterior and interior views and the layouts of the conference sites



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



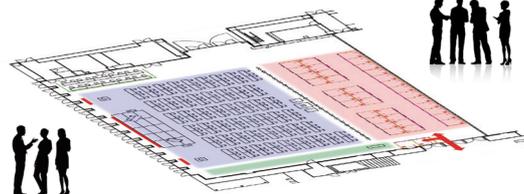
Co-location



Catalog distribution



Interaction between participants and exhibitors



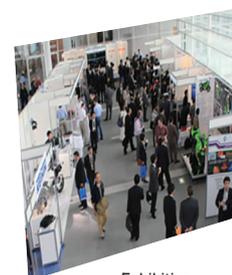
Product Technology



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

New Product Technology Session

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



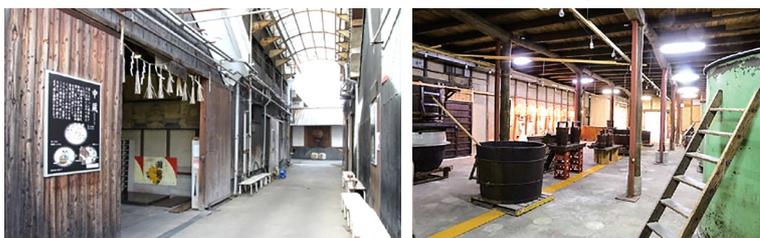
In the year 1333, Norimura Akamatsu (Enshin) built a fortress on Himeyama. Afterwards, Himeji Castle was expanded by feudal lords; Hideyoshi Toyotomi, Terumasa Ikeda, Tadamasa Honda and others, until it came into being in its entirety, as we see it today, in 1617.

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.

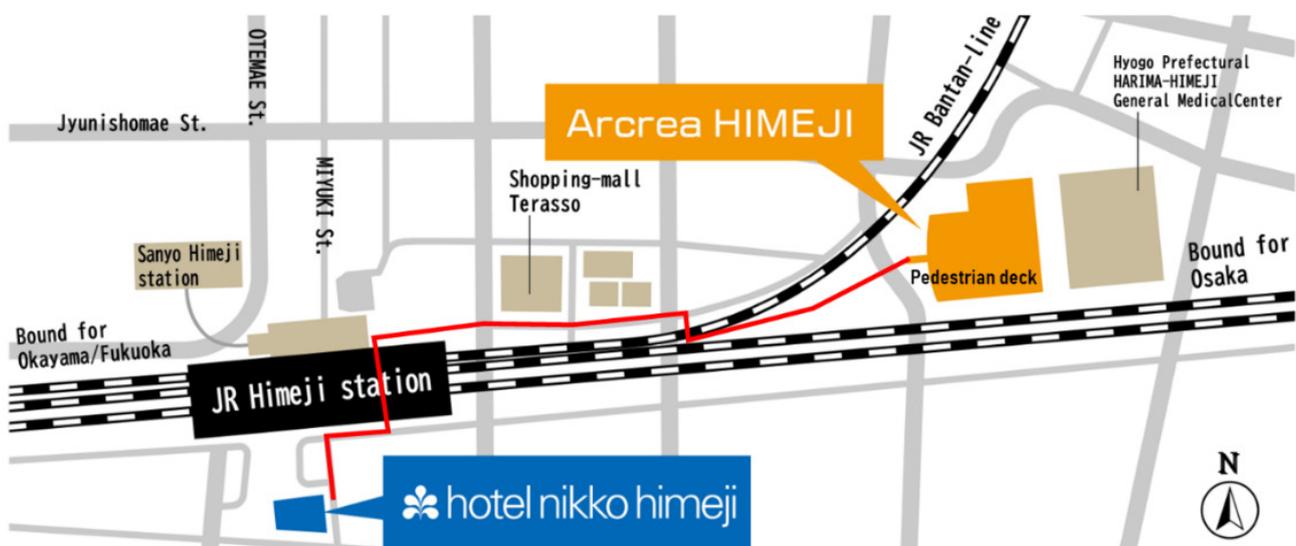
Now we are planning some attraction to provide Japanese atmosphere during the banquet. We hope it would be a memorable moment for all of the guests.

 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

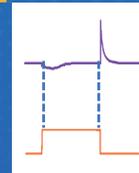
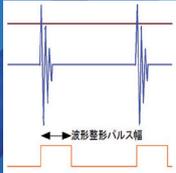
1991 Fulbright Scholarship (for Master's Program at Clemson)
1993 DAAD Scholarship (for 3-months study at Tokio University)
1995 Award for PhD Thesis (DLR, Germany)

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 μ 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





Kawasaki
Let the good times roll

**ENGINEERED
TO BE FREE**



Ninja

H2 SX

https://www.kawasaki-cp.khi.co.jp/corp_en/

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

Technical Sessions

Advanced Combustion (Continued)

20229060	Experimental quantification of the variation of heat released to the cooling system in a 4-stroke engine equipped with a passive combustion prechamber Luca Romani, Lorenzo Bosi, Francesco Balduzzi , Sandro Raspanti , Marco Ciampolini, Giovanni Ferrara (Università degli studi di Firenze)
20229070	Effects of ignition timing and fuel chemical composition on auto-ignition behavior and knocking characteristics under lean conditions Kaede Shirane, Toshiki Kimura, Sota Nakamura (Nihon University) , Akira Iijima, Karin Furusyo (Nihon University)
20229081	Use of Narrow Angle Split Injection Strategy for Improving The Performance of a Biogas-Diesel RCCI Engine Anirudh Koya, Gopa Kumar S, Ramesh A (IIT Madras)
20229089	Chemical Kinetic Analysis with Two-Zone Model on Spark Knock Suppression Effects with Hydrogen Addition at Low and High Engine Speeds Jun Goto , Minoru Yamamoto (Yamaha Motor Co., Ltd.) , Yoshimitsu Kobashi, Yoshito Ueno, Gen Shibata, Hideyuki Ogawa (Hokkaido University)
20229095	Improvements of Combustion and Emissions in a Natural Gas Fueled Engine with Hydrogen Enrichment and Optimized Injection Timings of Diesel Fuel 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	CO2 and H2 effects on lean limits and combustion characteristics of ethanol flame MZ Akram (Tsinghua University)
20229021	Impacts of methanol blended fuels on emissions and operating performance of two-wheelers Guilherme Pellizzaro Batalha (Graz University of Technology)
20229023	Effects of different prechamber spark plug geometries on combustion anomalies of an internal combustion engine Sebastian Oswald Söhnlein, Marco Taschek (Ostbayerische Technische Hochschule Amberg-Weiden), Jörn Alexander Judith, Sascha Holzberger, Maurice Kettner (Karlsruhe University of Applied Sciences)
20229061	Impact of Zero CO2 Fuels on Engine Behaviour of Two-Stroke Engines in Hand-Held Powertools Dominik Gschanes (Institut for Thermodynamics and Propulsion Systems)
20229067	Optimization of the Operating Strategy of a Dual-Fuel Engine Using POMDME as a Pilot Fuel Ann-Kathrin Jost (Technichal University of Kaiserslautern)
20229073	Effect of Blended Fuel of Hydrotreated Vegetable Oil and Fatty Acid Methyl Ester on Spray and Combustion Characteristics Shoi Koshikawa , Eriko Matsumura, Jiro Senda (Doshisha University)
20229074	E-Fuel applications in Non Road Mobile Machinery 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	A Study of Autoignition and Combustion Characteristics in an HCCI Engine using a Blended Fuel of DME and City Gas Yusuke Manabe, Shinji Mito, Akira Iijima (Nihon University), Shintaro Yoshihara, Takahiro Yamaguchi, Sekai Miyamoto (Kawasaki Heavy Industries, Ltd)
20229084	Effect of Gaseous Fuels with Different Carbon Numbers on Autoignition Properties Shinji Mito, Yusuke Manabe, Akira Iijima (Nihon University), Shintaro Yoshihara, Takahiro Yamaguchi, Sekai Miyamoto (Kawasaki Heavy Industries, Ltd.)
20229088	Verification of New Hydrogen Refueling Method for Fuel Cell Motorcycle Fumiaki Baba, Takeru Wakiya, Toru Ota (Suzuki Motor Corporation)
20229092	Effect of Different Fuel Supply System on Combustion Characteristics in Hydrogen SI Engine 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)

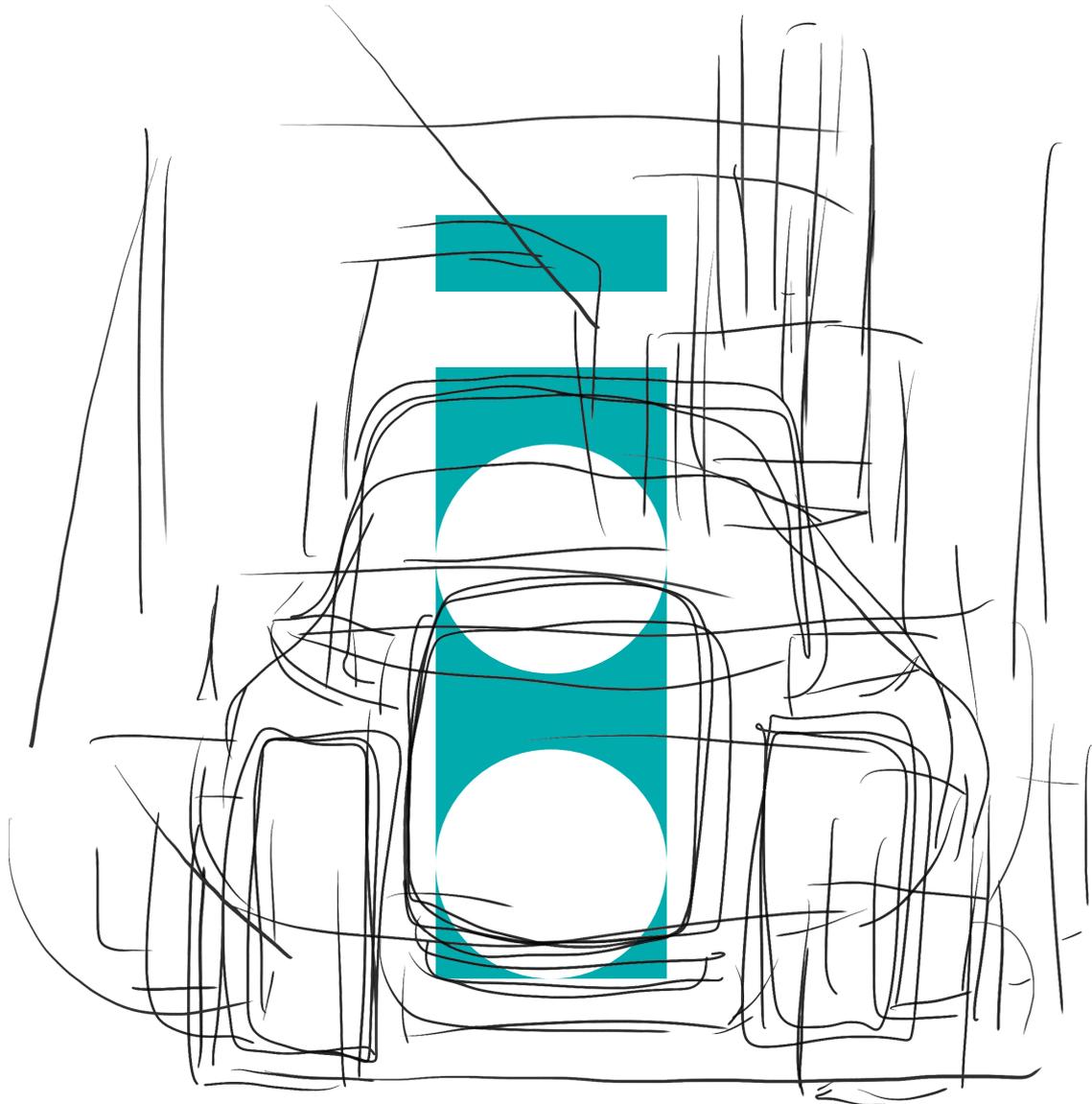
20229013	Effect of Pilot Injection on Improvement of Fuel Consumption and Exhaust Emissions of IDI Diesel Engines Yoshiyuki Kidoguchi, Yuzuru Nada, Tatsuya Ichikawa, Haruto Miyoshi, Kazuhiro Sakai (Tokushima University)
20229052	Development of 1.5L direct injection diesel engine with common rail system in compliance with EU StageV Shoichi Okimi, Kentaro Nagai, Reo Yoshida, Tomoya Akitomo, Takahiro Yamazaki (Kubota Corporation)
20229068	Studies on Spray and Combustion Characteristics of Throttle Type Nozzle Used in a Swirl-Chamber Diesel Engine 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	Impact of 3-way catalytic converters on particulate emission of MPFI motorcycle engines Sebastian Schurl (Graz University of Technology)
20229005	Design and Implementation of An Oxidation Catalyst For A Spark Ignited Two Stroke Snowmobile Engine Noah Robert Squires, Scott Miers (Michigan technological University)
20229019	Research for “Trap Catalyst” located on upper stream of main catalyst for suppressing the catalyst deterioration of internal combustion engine Daisuke Matsukawa, Kiichi Shimamura, Akihito Kasai, Shuto Sato (Honda R&D Co., Ltd.)
20229026	Carbon Footprint Calculation of Catalytic Converter Production – An Industrial Case Study Simon Merschak, Peter Hehenberger (University of Applied Sciences Upper Austria), Marcus Bonifer (Heraeus Deutschland GmbH & Co. KG)



Kubota Engine 100th Anniversary





ULTIMATE SPORT

- Hayabusa -



Perfectly Poised

Get ready for the ultimate riding experience.
And to create new legends of your own as you tame the beast that is destined to create its own new legend.

Technical Sessions

Emission and Environmental Impacts (Continued)

20229036	Evaluation of the applicability for an exhaust gas catalyst for motorcycles made of Rh alternative alloy materials Takuya Motegi, Natsuki Ako, Shunya Tatara, Kosuke Doi (Yamaha Motor Co., Ltd.)
20229047	Effects of Partial-Flow Diesel Particulate Filter on Diesel Engine Combustion and Particle Emissions Characteristics 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	Development of DPF regeneration system under all operating conditions for generators Daichi Kato (Kubota Corporation)
20229091	Observation of spray behaviors in a pipe at lower temperature for Urea-SCR system 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	A Novel Direct Gaseous Reformate Injector – Design and Experimental Study Asher Netzer-Lichinitzer, Leonid Tartakovsky (Technion – Israel Institute of Technology)
----------	--

(As of Apr 27, 2022)

Powertrain Controls

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

20229009	Wasted spark duration measurement as a method for firing TDC identification in small engines Adrian Irimescu , Simona Silvia Merola (Consiglio Nazionale delle Ricerche), Giovanni Cecere (CNR STEMS)
20229048	Increased Reliability and Usability through the Introduction of a User Interface Module for Hand-Held Small Engines Bahattin Öztürk (PRÜFREX Engineering e Motion GmbH & Co.KG)
20229058	Control-Oriented Engine Model for Online Fuel Identification 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	Distribution of Friction and Moment of Inertia in Start of SI Engine Naoki Miyaoka , Hirotaka Sato, Masato Shimizu, Junya Tanaka (Kogakuin University)
20229017	Effects of Engine Cooling System on Engine Performance: Balancing Engine Power and Fuel Consumption Yota Sakurai , Yoshinori Nakao, Atsushi Hisano (Kawasaki Heavy Industries, Ltd.), Kunihiro Tanaka, Michihisa Nakagawa (Kawasaki Motors, Ltd.)
20229028	Development of a Rotary Valve Engine for Handheld Equipment Norman H. Garrett , Mesbah Uddin (University of North Carolina - Charlotte), Mikael Bergman, Garrett Purvis (Husqvarna AB), Darrick Vaseleniuck, Dan Cordier (Vaztec)
20229055	Establishing a methodical approach to validate and improve the fuel economy of small capacity two-wheelers powered by internal combustion engines Juergen Tromayer, Martin Steyskall, Thomas Koenigshofer, Alexander Hagenberger (Graz University of Technology)
20229079	Feasibility study of boosted DI technology for sport motorcycle Hayatoshi Sato, Masaki Torigoshi (Yamaha Motor Co., Ltd.)
20229093	Design and Development of Variable Length Intake Manifold for Small Bore Engines 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	Development of Smart Drive 48V e-Motorcycle Hubert FRIEDL, Christian HUBMANN, Bernhard GRAF, Patrick FALK (AVL List Austria)
20229018	Efficiency Increase of a Conventional ICE Powertrain with CVT by 48V-Hybridization with Focus on L-Category Powersport Applications Alexander Hagenberger (Graz University of Technology)
20229025	Investigation on transient behavior and SoC balancing of a hybrid powertrain hand-held tool Dimitrios Vogiatzis (Graz University of Technology)
20229059	Technical Evaluation of Energy Requirements for hybrid powertrains for high performance motorcycles Balagovind Nandakumar Kartha, Qing Peng, Tatsuki Sugaya, Shinya Takasawa (Bosch Corporation)
20229085	Effect of Insulating Varnish Impregnation Range of Motor on Vibration Characteristics Yoshisada Sakamoto, Mihiro Nakanishi, Motoki Hirano, Yoshiyuki Terada (Suzuki Motor Corporation)

HONDA

The Power of Dreams

feel a Good Beat.



GB350

<https://global.honda/>



Empowered by a passion for innovation,
we create exceptional value and experiences
that enrich the lives of our customers.

Revs Your Heart

Technical Sessions

Hybrid and Electric Drives (Continued)

20229090	Energy Management in Hybrid Electric Powertrain by Implementation of Supervised Machine Learning Algorithms Pranay Nirapure, Mayank Mittal, Pradeep Menon (Indian Institute of Technology, Madras), Kanupriya Mittal (Anna University)
20229094	Suboptimal Online Energy Management for a Fuel Cell/Supercapacitor/Battery Electric Vehicle Using Artificial Neural Network Approach 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	Towards Efficient and Sustainable Small Engine Lubricants Jason Hanthorn , Yvonne Koay (The Lubrizol Corporation)
20229071	Tribological performance of palm oil blended with hexagonal boron nitride nanoparticles as an environment-friendly lubricant Mohd Fadzli bin Abdollah , Hilmi Amiruddin (Universiti Teknikal Malaysia Melaka)
20229072	Lubrication mechanisms of hexagonal boron nitride nano-additives water-based lubricant for steel-steel contact Hilmi Bin Amiruddin, Mohd Fadzli Bin Abdollah (Universiti Teknikal Malaysia Melaka)
20229077	Development of Low-Friction Pistons for Small Scooter Engines 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	Development of Resin Coated Piston suitable for Monolithic Cylinders made of Hypereutectic Al-Si Alloy Keita Watanabe, Hirotaka Kurita (Yamaha Motor Co., Ltd.)
20229024	Development of 1520 MPa higher fatigue strength light weight suspension spring Hideki Kato, Shinji Kasatori (Honda Motor Co., Ltd.), Hirokatsu Kameda (Hitachi Astemo, Ltd), Shoichi Suzuki (NIPPON STEEL SG WIRE CO., LTD)
20229041	Silver surface treatment applicable to bolts for motorcycles Hiroshi Hirayama (Honda Motor Co., Ltd.), Manabu Inoue, Takeshi Koike (DIPSOL CHEMICALS CO., LTD)
20229042	Structural optimisation of motorcycle top bridges Riku Mitsui (Yamaha Motor Co., Ltd.)
20229075	Effect of bonding conditions on the bonding of wear-resistant steel and aluminum castings Takaharu Suzuki, Hisashi Harada (Yamaha Motor Co., Ltd.)
20229078	Stiffness optimization process using topology optimization techniques and lattice structures 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	Prediction of Fatigue Strength of Motorcycle Exhaust System in Higher Temperature Range Takanori Nagata (Honda Motor Co., Ltd.)
20229014	Application of AI for Predicting Test Cycles of Drivetrain Component Gaurav Sirsaj (Dana India), Vinay Vilas Kharche (Dana India Technical Center)
20229031	An estimation method of blended fuel contents by data assimilation for carbon neutral powertrain Naoki Yoneya (Hitachi, Ltd.), Kenji Amaya (Tokyo Institute of Technology)
20229045	Measurement of propagating flame in a gasoline engine under transient operating conditions using a multiple-ion probe Tomoaki Yatsufusa, Yuki Goto (Hiroshima Institute of Technology),
20229046	Development of Simulation Model for Estimating Loads Applied to Scooter Frame when Traveling on Rough Roads Tetsuharu Maruyama, Shinya Takahashi (Honda Motor Co., Ltd.)
20229053	Local change of PV value on end faces of rocker pins of chain type CVT (Continuously Variable Transmission) under transmitting condition Ryunosuke Kikui (Graduate school of Doshisha University), Kazuya Okubo, Kiyotaka Obunai (Doshisha University)
20229065	Crankshaft Dynamics and Durability Analysis Aju Joseph, S Karthik (Royal Enfield)
20229113	CFD analysis of a port fuel injection IC engine to study mixture preparation and combustion and its impact on raw emissions 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	Development of Light-weight, Low-noise Exhaust Muffler Using the Laminated Structure for the Muffler Outer Shell Junichiro Suzuki, Yuji Kurasawa, Satoru Maki, Kazuyuki Oda (Honda Motor Co., Ltd.)
20229037	Application of Participation Factor Focusing on Response at Specific Part for Vibration Evaluation of Motorcycle Frame Masashi Michiue, Takeyuki Sakai (Kawasaki Heavy Industries, Ltd.), Manabu Morikawa, Naoki Arino (Kawasaki Motors, Ltd.)
20229056	Novel 3D Printed Exhaust Silencer for Small Engine Noise Control Applications Margus Villau , Hans Rämmal, Jüri Lavrentjev (Tallinn University of Technology)
20229064	Sound Quality, Pass-by Noise, Exhaust Emissions, Performance, Rideability - How to best balance these attributes? 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

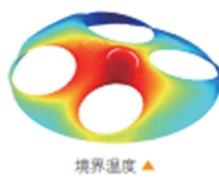
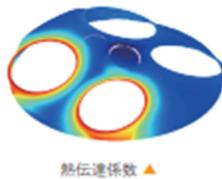
燃焼時の燃焼ガス伝播に基づくピストンクラウン、燃焼面の境界条件

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

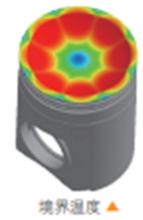
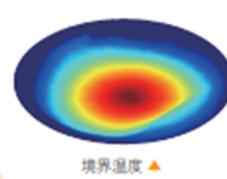
影響因子

- 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



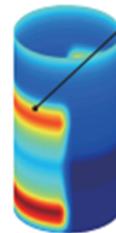
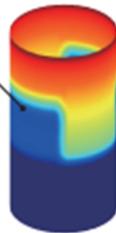
ピストンクラウン



FE(有限要素)モデルへの境界条件マッピング

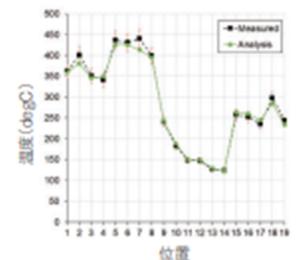
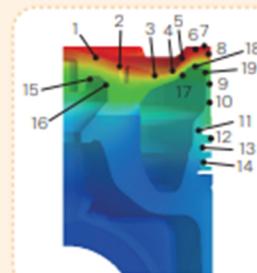
ライナー

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
製造エンジニアリング事業本部 Automotive営業部
TEL : 03-5859-3012

Beyond the Drivetrain



We devote all technologies to the drivetrain parts, with passion and seriousness.

The primary function of the drivetrain is to transform the driving force generated by the motor or engine into a more valuable motion without waste, and to transmit it to the tires, etc. EXEDY Corporation will continue to contribute to the valuable future of drivetrains.

EXEDY
Excellent & Dynamic

EXEDY Corporation
1-1-1 Kidamotomiya, Neyagawa-shi, Osaka,
572-8570, Japan
Tel: 81-72-822-1151 Fax: 81-72-824-3873
www.exedy.com/en/

Motors for Drones



Clutches for Motorcycles

Engine Starter Clutches



CVTs for Scooters



E³-Drive Technology

E³-Assist Pallet



Multi-Plate Clutches for Motorcycles



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.

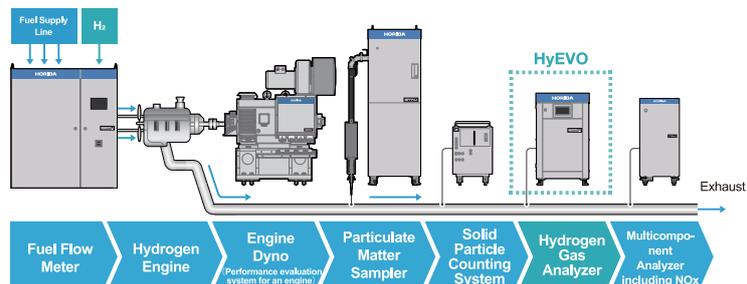


NEW



Hydrogen Measurement Applications

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



Technical Sessions

(As of Apr 27, 2022)

Two Stroke Engine

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

20229012	Experimental Analysis of a Uniflow Scavenged Two-Stroke Concept Stefan Sturm (Graz University of Technology)
20229032	Emissions and Performance Impact of E20 on a Two-stroke Engine Scott A. Miers , Brian J Eggart (Michigan Technological University), John G. Loesche (General Motors)
20229057	On the Potential of Transfer Port Injection Strategies for a Two-Stroke Engine Francesco Balduzzi, Luca Romani, Giovanni Ferrara (Università degli Studi di Firenze)
20229063	Describing the Auto-Ignition Quality in Small, Air Cooled, Two Stroke Engines Per Risberg, Thomas Elm, Fredrik Hellquist, Mikael Bergman (Husqvarna Group), Anna Karvo, Rupali Tripathi (Neste Oyj)
20229076	Study of Pre-chamber Jet Combustion Behavior using a Small Two-stroke Optically Accessible Engine 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	Numerical Investigation of the Effect of Engine Speed and Delivery Ratio on High Speed Knock in a Small Two-stroke SI Engine 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	Application of a Road Simulator to Efficient Fatigue Reliability Evaluation of an Off-road Motorcycle Hideki Makida (Kawasaki Motors, Ltd.)
20229029	Development of evaluation technology for motorcycle advanced rider assistance systems Shohei Hosokawa, Kazuya Nagasaka (Kawasaki Heavy Industries, Ltd.), Hiroyuki Watanabe (Kawasaki Motors, Ltd.)
20229030	A Tire Model to estimate Influence of Tire Rolling Resistance on the Efficiency of Motorcycles Barath Mohan (TVS Motor Company Ltd)
20229039	Development of Tire Force Estimation Logic for Off-road Four-wheelers Taichi Inaba, Takenori Terada, Atsushi Sano (Kawasaki Heavy Industries, Ltd.), Hideyuki Kato (Kawasaki Motors, Ltd.)
20229062	Novel Sensor based Real Time Road Profile Estimation using Machine Learning in Two-Wheelers Barath Mohan (TVS Motor Company Ltd)

Technical Sessions

Vehicle Dynamics and Safety (Continued)

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

Koko-en, 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

■ **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

Himeji City Map





Solution partners of experimental production



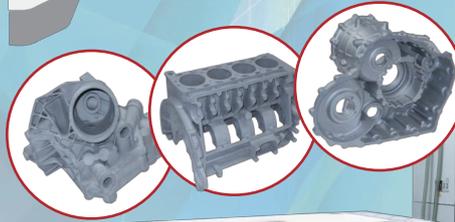
Thailand Factory



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.

北陸軽金属工業株式会社

Hokuriku Light Metal Industry Co., Ltd.

Japan Factory : 138-2 Akamaha Yoriii-machi, Osato-gun, Saitama-ken
369-1211, Japan

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

(Blank)



**SETC2022 URL <https://www.setc-jsae.com/>
Society of Automotive Engineers of Japan, Inc. E-mail: SETC2022@jsae.or.jp**