



Energy Intelligence  
Beyond Borders:  
Adapting in  
a Post-Pandemic Society

KYUSHU UNIVERSITY  
**E**nergy Week 2021

**Date** [Fri] 22 Jan.- [Fri] 29 Jan., 2021

\*Another related event will be held in early spring

**Venue** KYUSHU UNIVERSITY Ito Campus 744 Motoooka, Nishi-ku, Fukuoka 819-0395, JAPAN

Hospital Campus 3-1-1 Maidashi, Higashi-ku, Fukuoka 812-8582, JAPAN

\*Held online (partially face to face)

<https://q-pit-ew.kyushu-u.ac.jp/en/>



\* Departments participating in Energy Week 2021, related to the energy research in Kyushu University

#### Contacts

Date	Program	Departments	Contact
1/22(Fri)	Q-PIT related programs	Kyushu University Platform of Inter-/ Transdisciplinary Energy Research	092-802-6644
1/25(Mon)	Chikushi Symposium	Faculty of Engineering Science, Kyushu University	092-583-8626
1/22(Fri)・25(Mon)・26(Tue)	I <sup>2</sup> CNER related programs	International Institute for Carbon-Neutral Energy Research, Kyushu University	092-802-6935
1/28(Thu)~29(Fri)	HYDROGENIUS related programs HYDROGENIUS・I <sup>2</sup> CNER・ HydroMate Joint Research Symposium	Research Center for Hydrogen Industrial Use and Storage, Kyushu University	092-802-3924
3/3(Wed)	C <sup>2</sup> RSC Symposium	Center of Coevolutionary Research for Sustainable Communities, Kyushu University	092-802-6677

# Contents

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Message .....	2
About Kyushu University Energy Week .....	3
Venue .....	4
Program & Schedule .....	6
Jan. 22 (Fri.)	
Kyushu University Platform of Inter- /Transdisciplinary Energy Research (Q-PIT) Plenary Session ...	8
I <sup>2</sup> CNER Thrust Workshop.....	14
Jan. 25 (Mon.)	
Chikushi Symposium .....	16
I <sup>2</sup> CNER-IMI International Workshop .....	17
Jan. 26 (Tue.)	
I <sup>2</sup> CNER Annual Symposium .....	18
Jan. 28 (Thu.)	
Hydrogen Energy and Fuel Cell Forum in Kyushu & International Hydrogen Energy Development Forum 2021 .....	20
Jan. 28 (Thu.) – 29 (Fri.)	
- HYDROGEN-MATERIALS INTERACTIONS - HYDROGENIUS, I <sup>2</sup> CNER, and HYDROMATE Joint Research Symposium .....	21
Jan. 29 (Fri.)	
- HYDROGENIUS & I <sup>2</sup> CNER TRIBOLOGY SYMPOSIUM - HYDROGENIUS and I <sup>2</sup> CNER Joint Research Symposium .....	22
International Symposium of Hydrogen Polymers Team, HYDROGENIUS .....	23
Mar. 3 (Wed.)	
Kyushu University COI Center of Coevolutionary Research for Sustainable Communities (C <sup>2</sup> RSC) Symposium ...	24

# Message

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President  
Kyushu University

**Tatsuro Ishibashi**

I would like to take this opportunity to express my sincere gratitude for your participation and interest in Kyushu University Energy Week 2021.

Under our mission statement, “with continual and autonomous reforms, while guaranteeing educational quality at an international level, we will aim to be top-level education and research hub marked by vitality and a willingness to address future issues”, we established the Kyushu University Platform of Inter-/Transdisciplinary Energy Research in October 2016, as our platform organization in the energy sector.

Historically, Kyushu has been Japan’s gateway to Asia and a key trading place with foreign countries. Kyushu also led Japan in introducing regenerative energy technology, taking advantage of its rich natural resources and mild climate. Kyushu University is located in Fukuoka, among the first places in Asia to enter the industrial revolution and a place that once played a central role in Japan’s energy industry. In the light of this historical background, our university is actively engaged in creative fundamental energy research in a wide range of areas.

The global key issue, in a post pandemic world, will be a green recovery and the achievement of carbon neutrality. The Government of Japan has recently pledged to become a carbon neutral society by 2050 and we consider the coming months and years as crucial to achieve this goal.

The trend of divestment from fossil fuels to sustainable energy is rapidly increasing, and there is an increasing call for development and wide-spread application of sustainable energy, including hydrogen-based energy technologies. Problems which previously hampered new energy development are being solved at fast speed and the competition is fierce in research & development.

To seek practical solutions, researchers and engineers from all areas must work together and approach these issues from various angles. In addition, it is necessary to continuously challenge ourselves in the process of new discovery, research, development, and practical application, in our ambition to strive to realize sustainable development of a “future energy society.”

This year we will be holding the Kyushu University Energy Week 2021 under the theme “Energy Intelligence Beyond borders: Adapting in a Post Pandemic Society”.

This marks the fifth annual event and we will be focusing on various energy issues related to the ongoing pandemic by inviting prominent lecturers from international and domestic organizations and the private sector. Moreover, in collaboration with our International Institute for Carbon-Neutral Energy Research (I<sup>2</sup>CNER), Research Center for Hydrogen Industrial Use and Storage (HYDROGENIUS), Faculty of Engineering Sciences (FES), Center of Coevolutionary Research for Sustainable Communities (C<sup>2</sup>RSC) and other related organizations within the university, we will be holding symposiums that introduce the activities of our faculty, including research presentations by young researchers. As part of our activities as an international research hub in the energy sector, we are also scheduling to hold research presentations provided by overseas students and young researchers for the purpose of international joint research. We sincerely look forward to your participation in the various program events.

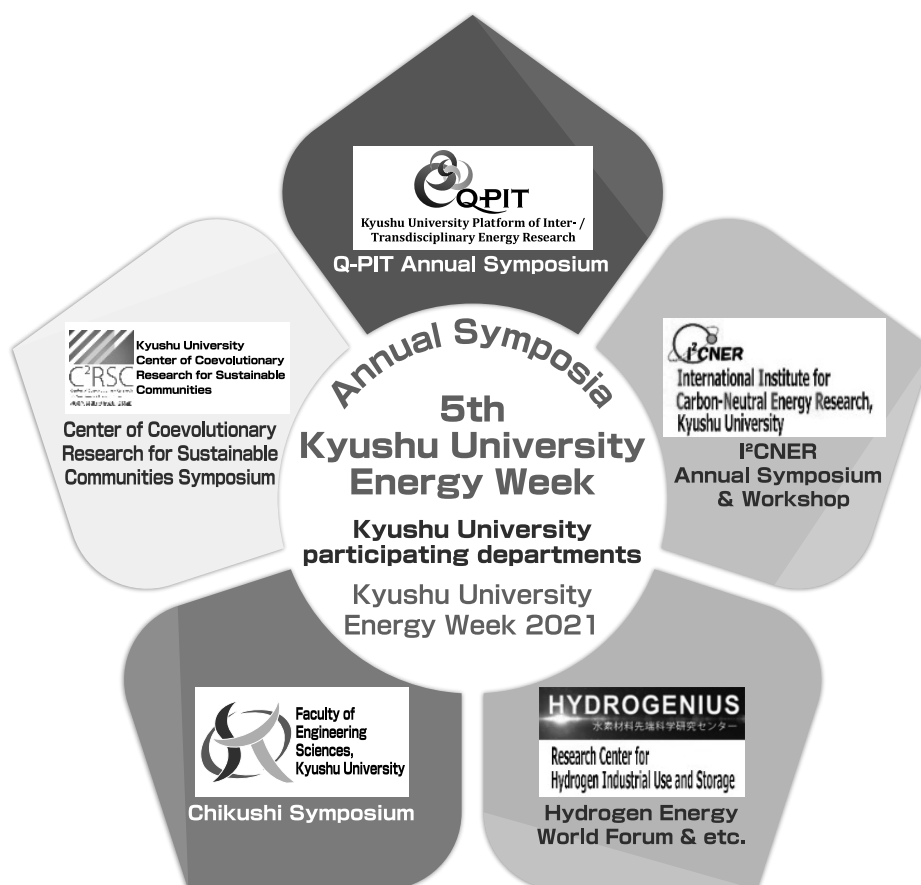
# About Kyushu University Energy Week

## What's Kyushu University Energy Week ?

Energy Week is an annual international conference organized by Kyushu University. With a focus on “future energy”, it features a variety of academic workshops, symposia, invited lectures from prominent energy researchers, as well as public events that bring together prominent experts from academia, industry and government. Another aim of Energy Week is the promotion of early-career researchers through a poster session.

The conference is considered to be Kyushu University's main venue to promote exchange among researchers and practitioners in the energy sector, and to highlight its role as an international hub for sustainable energy research.

Due to the ongoing global Covid-19 crisis, Energy Week 2021 will primarily be held as an online event this year.

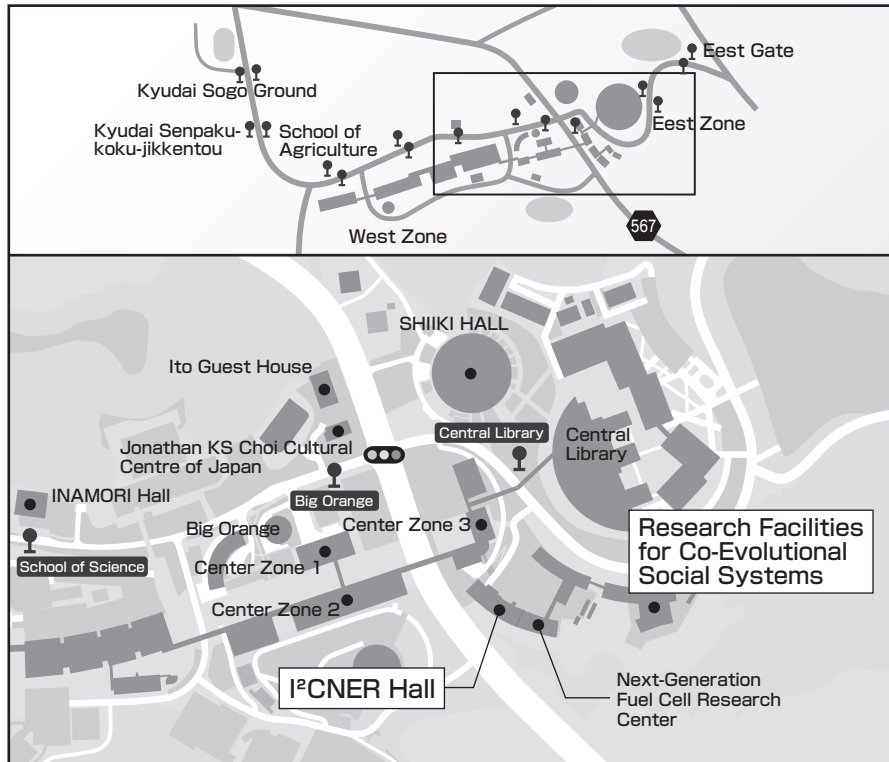


# Venue

## KYUSHU UNIVERSITY Ito Campus

● I<sup>2</sup>CNER Hall ● Research Facilities for Co-Evolutional Social Systems

744 Motoooka, Nishi-ku, Fukuoka, 819-0395, JAPAN



 Bus stop

### ★ From Fukuoka Airport

Fukuoka Airport → (Subway Kuko Line) → Meinohama Station (\*<sup>1</sup> Transfer JR Chikuhi Line) → Kyudai-Gakkentoshi Station → \*<sup>2</sup> Showa Bus (via Susenji or Yokohamanishi or Gakuendori) → Ito Campus

### ★ From Hakata or Tenjin Station

By subway

Hakata Station (Subway Kuko Line) → Tenjin → Meinohama (\*<sup>1</sup> Transfer JR Chikuhi Line) → Kyudai-Gakkentoshi Station → \*<sup>2</sup> Showa Bus (via Susenji or Yokohamanishi or Gakuendori) → Ito Campus

※ 1 Alternatively, board a train bound for Nishikaratsu or Chikuzen-Maebaru, which eliminates the need to transfer at Meinohama Station.

※ 2 For West zone → bus stop No.3

Get off at the bus stop "Big Orange Mae" → I<sup>2</sup>CNER or (Research Facilities for Co-Evolutional Social Systems)

※ 2 For East zone → bus stop No.4

Get off at the bus stop "Center of library" → I<sup>2</sup>CNER or Research Facilities for Co-Evolutional Social Systems

By bus

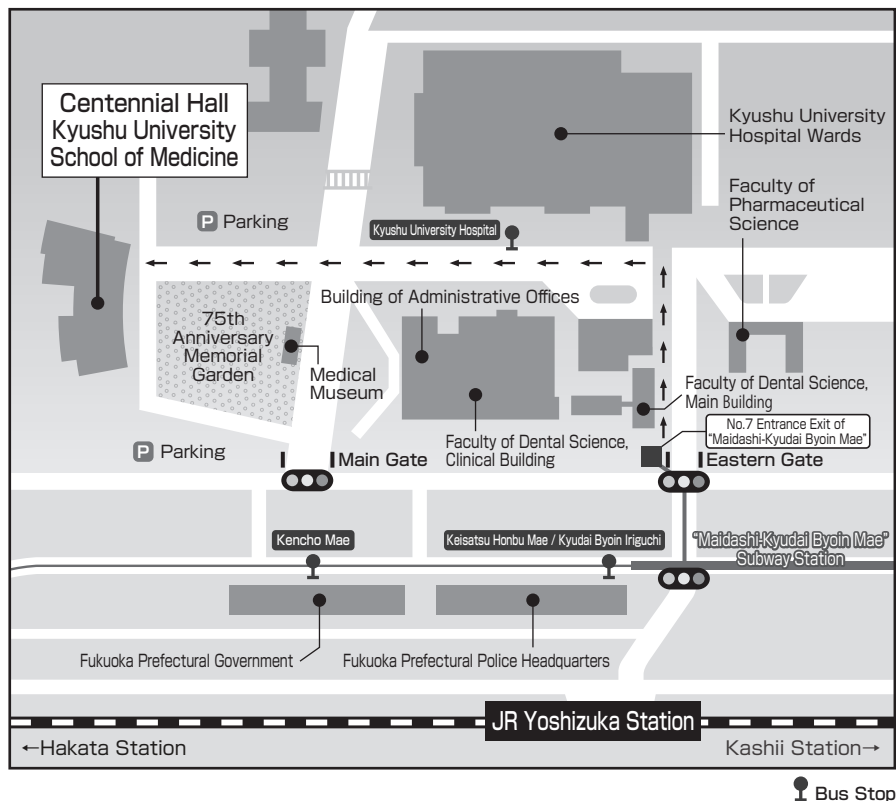
Bus stop of Hakata StationA (Nishitetsu Bus for Kyudai Ito Campus) → Bus stop of Solaria Stage → \*<sup>3</sup> Ito Campus

※ 3 Get off at the bus stop "Big Orange Mae" → I<sup>2</sup>CNER or Research Facilities for Co-Evolutional Social Systems

## Kyushu University Hospital Campus

● Centennial Hall Kyushu University School of Medicine

1-1 Maidashi 3-chome Higashi-ku, Fukuoka 812-8582, JAPAN



### ★ From Fukuoka Airport

Fukuoka Airport → (Subway Kuko Line) → Nakasu Kawabata Station (Transfer Subway Hakozaki Line) → Maidashi-Kyudai Byoin Mae Station → Kyushu University Hospital Campus → Centennial Hall Kyushu University School of Medicine

### ★ From Hakata Station

By subway

Hakata Station (Subway Kuko Line) → Nakasu Kawabata Station (Transfer Subway Hakozaki Line) → Maidashi-Kyudai Byoin Mae Station → Kyushu University Hospital Campus → Centennial Hall Kyushu University School of Medicine

By bus

Bus stop of Hakata Center buildingE (Nishitetsu Bus for Chiyomachi) → Bus stop of Kyudai Byoin → Kyushu University Hospital Campus → Centennial Hall Kyushu University School of Medicine

### ★ From Tenjin Station

By subway

Tenjin Station (Subway Hakozaki Line for Kaizuka) → Maidashi-Kyudai Byoin Mae Station → Kyushu University Hospital Campus → Centennial Hall Kyushu University School of Medicine

# Program & Schedule

Date	Dept.	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30
Jan.22 (Fri)	Q-PIT											Q-PIT Plenary Session: Opening Ceremony / Keynote Lecture [JPN]			
	I <sup>2</sup> CNER														
Jan.25 (Mon)	FES														
	I <sup>2</sup> CNER & IMI	(8:40-) I <sup>2</sup> CNER-IMI International Workshop [ENG]													
Jan.26 (Tue)	I <sup>2</sup> CNER		I <sup>2</sup> CNER Annual Symposium [ENG]												
Jan.28 (Thu)	HYDROGENIUS									Hydrogen Energy and Fuel Cell Forum in Kyushu and International Hydrogen Energy Development Forum 2021					
	HYDROGENIUS & I <sup>2</sup> CNER														
Jan.29 (Fri)	HYDROGENIUS & I <sup>2</sup> CNER				-2021 HYDROGENIUS & I <sup>2</sup> CNER TRIBOLOGY SYMPOSIUM - HYDROGENIUS and I <sup>2</sup> CNER JOINT RESEARCH SYMPOSIUM [ENG]										
	HYDROGENIUS				International Symposium of Hydrogen Polymers Team, HYDROGENIUS [ENG]										
Mar.3 (Wed)	C <sup>2</sup> RSC (COI)									Kyushu University COI Center of Coevolutionary Research for Sustainable Communities (C <sup>2</sup> RSC) Symposium					

- ※Q-PIT: Kyushu University Platform of Inter/Transdisciplinary Energy Research
- ※I<sup>2</sup>CNER: International Institute for Carbon-Neutral Energy Research
- ※HYDROGENIUS: Research Center for Hydrogen Industrial Use and Storage
- ※FES: Faculty of Engineering Science
- ※C<sup>2</sup>RSC: Center of Coevolutionary Research for Sustainable Communities
- ※IMI: Institute of Mathematics for Industry

\* Above Program is subject to change without prior notice.



16:00	16:30	17:00	17:30	18:00	18:30	19:00	19:30	20:00	20:30	21:00	21:30	22:00	22:30	23:00	23:30	24:00
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Web Contents

Q-PIT Plenary Session: Panel Discussion																
																I <sup>2</sup> CNER Thrust Workshop [ENG] (-2:00)

Chikushi Symposium [ENG]																

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																- HYDROGEN-MATERIALS INTERACTIONS - HYDROGENIUS, I <sup>2</sup> CNER, and HYDROMATE JOINT RESEARCH SYMPOSIUM 2021 [ENG]

																- HYDROGEN-MATERIALS INTERACTIONS - HYDROGENIUS, I <sup>2</sup> CNER, and HYDROMATE JOINT RESEARCH SYMPOSIUM 2021 [ENG]

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Poster Presentation (Doctoral / graduate students, international doctoral students / researchers)

**Kyushu University Platform of Inter-/Transdisciplinary  
Energy Research (Q-PIT)**  
**<Plenary Session >**

<Date> 13:30-16:50, 22<sup>th</sup> January 2021  
 <Venue> I<sup>2</sup>CNER Hall, I<sup>2</sup>CNER Bldg. 1, Ito Campus, Kyushu University (Live streaming venue)  
 <Language> Japanese  
 <Theme> “ Thinking about energy and environmental issues in the Beyond Corona era ”  
 <Moderator> Prof. Kentaro Yoshida, Q-PIT, Kyushu University

< Program and Speaker >

Time	Program and Speaker
13:30-13:40	<b>Opening Ceremony</b> Welcome Address, Dr. Tatsuro Ishibashi, President of Kyushu University
13:40-14:25	<b>Keynote Lecture 1:</b> <b>Renewable energy-based energy systems in an Internet of Energy (IoE) society</b> Prof. Hiroshi Asano, Gifu Renewable Energy System Research Center, Gifu University, Tokai National Higher Education and Research System ( President, Japan Society of Energy and Resources (JSER) )
14:30-15:15	<b>Keynote Lecture 2</b> <b>Energy in Carbon Neutral Era</b> Dr. Yukari Yamashita, Managing Director, The Institute of Energy Economics, Japan ( Executive Vice President, International Association for Energy Economics (IAEE) )
15:15-15:30	Break
15:30-16:45	<b>Panel Discussion</b> Theme : Thinking about energy and environmental issues in the Beyond Corona era Moderator : Prof. Kentaro Yoshida, Q-PIT, Kyushu University Panelists : Prof. Hiroshi Asano, Gifu University Dr. Yukari Yamashita, The Institute of Energy Economics, Japan Prof. Kazunari Sasaki, Senior Vice President, Kyushu University Prof. Akari Hayashi, Q-PIT, Kyushu University Associate Prof. Tatsuya Wakeyama, Q-PIT, Kyushu University
16:45-16:50	<b>Closing Remarks</b> Dr. Yoshio Hisaeda, Executive Vice President, Kyushu University

■ **Web contents (released during EW2021)**

● **Poster Presentation**

•By Doctoral/graduate students, international doctoral students/researchers



## Keynote Lecture 1

Renewable energy-based energy systems in an Internet of Energy (IoE) society

**Hiroshi Asano**

Professor  
Gifu Renewable Energy System Research Center, Gifu University, Tokai National Higher Education and Research System



## Keynote Lecture 2

Energy in Carbon Neutral Era

**Yukari Niwa Yamashita**

Managing Director  
The Institute of Energy Economics, Japan  
Visiting Professor, Kyushu University

## Panel Discussion



Moderator

**Kentaro Yoshida**

Professor  
Q-PIT, Kyushu University



Panelists

**Kazunari Sasaki**

Professor  
Senior Vice President, Kyushu University



Panelists

**Akari Hayashi**

Professor  
Q-PIT, Kyushu University



Panelists

**Tatsuya Wakeyama**

Associate Professor  
Q-PIT, Kyushu University

## Keynote Lecture 1



### Renewable energy-based energy systems in an Internet of Energy (IoE) society

Professor,  
Gifu Renewable Energy System Research Center, Gifu University, Tokai  
National Higher Education and Research System

**Hiroshi Asano**

#### Abstract

Digital transformation is being accelerated due to COVID-19 pandemic. The Society 5.0 is a vision of future society presented in the 5th Science and Technology Basic Plan, that is a new society coming up after Information Society. The Society 5.0 is sophisticated integration of cyberspace and physical space, reconciles economic growth and resolution of social issues, and realizes a human-centered and inclusive society. The Cross-Ministerial Strategic Innovation Promotion Program (SIP), Cabinet Office, Government of Japan, 5-year national project, accelerates the realization of Society 5.0. The title of “Energy system for decarbonizing society” have started in the energy and environment field in 2018, and reorganized as “Energy systems for an IoE Society” in 2019. Internet of Energy (IoE) is the Energy version of IoT, then the connectivity and the digital utility play important role. I lead one of sub-program (A) focused on integrated energy management systems, “The design of energy system for an IoE Society”. It is to realize a smart city and efficient usage of electric power with a sharing economy that mainly uses renewable energy. The Virtual Power Plant contributes to the aggregated utilization of Distributed Energy Resources (DERs) to support more integration of variable renewable generation. As clusters of multiple smart communities expand, the micro grids leveraging renewable energy will make efficient energy management available.

Energy systems for an IoE Society including sector integration (sector coupling) between traffic management and the energy network including energy conversion, storage and transport technologies will be designed. Collection of digital data required for designing regionally distributed energy systems, perspective to be considered during design, roles of stakeholders such as local governments, design procedures, etc., will be formulated as a guideline for designing local energy systems. A guideline will be formulated to design regional energy systems for private businesses joining establishment of new energy systems for local governments and regions. This will contribute to establishment of systems suitable for local characteristics such as industrial structures and energy demand and supply structures, as well as optimization of energy usage. Also, the integrated system architecture will be rolled out internationally.

## Keynote Lecture 2



### Energy in Carbon Neutral Era

Managing Director  
The Institute of Energy Economics, Japan  
Visiting Professor, Kyushu University

**Yukari Niwa Yamashita**

#### Abstract

2020 began with a slump in coordinated production cuts due to dispute within OPEC Plus. Already declining oil prices plunged in early spring due to suspensions in both international and domestic transports and a blow to the economy due to the rapid spread of the corona, hitting the oil and gas industry directly. The sudden disappearance of energy demand caused by the corona has hit international energy companies and energy producers hard. Companies have also been under pressure from the financial world, which has emphasized ESG investment in recent years, and the deterioration of the investment environment due to the corona disaster has accelerated the shift of a business models from those centered on fossil fuels to those supporting decarbonization.

On the other hand, policy guidance that combines economic measures and climate change countermeasures in Europe, such as green recovery in the EU and sustainable recovery of the IEA, attracted attention, and climate change countermeasures were recognized as an important agenda in the global economic slowdown. Former U.S. Vice President Biden's presidential victory in the U.S. was also received as a suggested US participation in the decarbonization race, with Japan and China also becoming members aiming to decarbonize with a speech by Prime Minister Suga and a decarbonization declaration by Chinese President Xi.

In 2020, it was also a year in which the seriousness of move towards decarbonization increased with a sense of speed as if caught up in the rapids. Although each country's response is not uniform, due to differences in energy supply and demand structures and industrial structures. In addition, in order to continue sustainable growth while addressing climate change towards the end of 2050 or the end of this century, it is extremely important whether innovative technologies that will be developed in the future can be utilized. We must not forget the challenge of how to supply energy economically and cleanly to people in developing and emerging countries that do not yet have sufficient energy access. In the development of decarbonization technologies, it is important for various countries and companies to cooperate and then compete, and to secure a diverse supply of clean energy while lowering costs.

## Kyushu University Platform of Inter-/Transdisciplinary Energy Research (Q-PIT)

### <Poster Presentation >

Awardees of Q-PIT Doctoral Students Support Program and Overseas Students, Researchers of International Joint Research

<Date> Post by 22<sup>nd</sup> January 2021  
 <Language> English and Japanese  
 <U R L> <https://q-pit-ew.kyushu-u.ac.jp/en/poster>

#### [Awardees]

No. of Poster	Affiliation	Name	Title of Research
Gold-1	Graduate School of Economics	中石 知晃	パラメトリックフロンティア分析法による限界削減費用の推計に基づいた中国石炭火力発電所 316 基の戦略的な CO <sub>2</sub> 及び SO <sub>2</sub> 排出量削減政策
Silver-2	Graduate School of Engineering	本石 祐輝	拡張 $\pi$ 系芳香族カチオンの集積による高アニオン伝導性とアルカリ安定性の両立がもたらすアニオン交換膜型燃料電池の発展
Silver-3	Interdisciplinary Graduate School of Engineering Sciences	西尾 陽	Na イオン電池用 Cr 含有ポリアニオン系正極材料の充放電反応機構解明
Bronze-4	Graduate School of Engineering	Islam Mir Shariful	Carbon-di-oxide utilization for fast algae cultivation
Bronze-5	Graduate School of Engineering	河原 康仁	その場引張 TEM 観察による Al-Mg-Si 系合金の析出強化に及ぼす Cu 添加の影響の解明
Bronze-6	Graduate School of Bioresource and Bioenvironmental Sciences	石田 紘一郎	界面反応により局所的に表面改質されたセルロースナノファイバーの自己組織化
Bronze-7	Graduate School of Integrated Frontier Sciences	SELYANCHYN Olena	Sulfonic acid-crosslinked nanocellulose as a novel polymer electrolyte membrane for hydrogen fuel cells
Encouragement-8	Graduate School of Engineering	池田 京	固体触媒中のヒドリドが窒素還元反応に及ぼす影響の理論化学的な考察
Encouragement-9	Graduate School of Engineering	松川 祐子	新規ニッケル-チオール錯体の簡便な作製法と硫化物前駆体としての利用
Encouragement-10	Interdisciplinary Graduate School of Engineering Sciences	河内 裕一	ヘリコン波プラズマにおけるイオンセンシティブプローブ計測の検討
Encouragement-11	Graduate School of Engineering	辻川 皓太	機械学習による次世代型燃料電池材料の熱膨張率予測プログラムの開発
Encouragement-12	Graduate School of Economics	緒方 鞠	データ包絡分析法を用いた日本のバイオディーゼル製造プラントの生産効率性分析
Encouragement-13	Graduate School of Engineering	Rahman Md Matiar	Synthesis of rice straw derived activated carbon for capturing carbon dioxide
Encouragement-14	Interdisciplinary Graduate School of Engineering Sciences	小林 大輝	プラズマ中における大域構造振動と局所乱流の相互作用の探究
Encouragement-15	Graduate School of Science	相本 雄太郎	分子性触媒による酸素生成反応の素過程抽出に基づく反応機構解析

Encouragement-16	Graduate School of Engineering	Tu Hoan Phuc	Synthesis of flowerlike Ce <sub>1-x</sub> Zr <sub>x</sub> O <sub>2</sub> as catalyst support for hydrogen production from biogas
Encouragement-17	Graduate School of Economics	鬼頭 みなみ	航空機の使用年数と買い替えサイクルの変化が環境と経済に与える影響
Encouragement-18	Interdisciplinary Graduate School of Engineering Sciences	山口 忠則	海洋数値モデルによって明らかになった 2019 年秋季のケンサキイカ不漁と海況との関係
Encouragement-19	Interdisciplinary Graduate School of Engineering Sciences	児島 富彦	レーザー核融合推進の実現に向けた磁気ノズルにおける磁力線からのプラズマ離脱（デタッチメント）に関する数値解析
Encouragement-20	Interdisciplinary Graduate School of Engineering Sciences	RUI XIAOTIAN	Design, Synthesis of Carbazole Dendrimer with Doublet-Excited Luminescent Radical as Core
Encouragement-21	Graduate School of Information Science and Electrical Engineering	Ahmad Hasan Elsayed Mansour Gendia	Energy-Efficient Reinforcement Learning-Based UE Pairing in Non-Orthogonal Multiple Access Wireless Communication Systems
Encouragement-22	Graduate School of Engineering	張 馳	Cross-country evidence on multi-tier electricity accessibility, perceived inequality, and subjective well-being
Encouragement-23	Graduate School of Engineering	Zhang Nan	Mitigation of hydrogen embrittlement by addition of ammonia impurity
Encouragement-24	Graduate School of Engineering	Yasir Ararat Hutapea	Development of High Oxygen Barrier PEM for Durable PEFC Systems
Encouragement-25	Graduate School of Integrated Frontier Sciences	田島 正俊	バッテリーボウルを用いた水系 Na イオン電池
Encouragement-26	Interdisciplinary Graduate School of Engineering Sciences	RUPAM TAHMID HASAN	Characterization of Two Fumarate based MOFs for Water based Adsorption Heat Pumps
Encouragement-27	Interdisciplinary Graduate School of Engineering Sciences	MD RAUF UL KARIM KHAN	Simplified Process of In-Ga-Zn-O Thin-film transistor utilizing Selective Etching of Copper Source and Drain

## 【Overseas Students, Researchers of International Joint Research】

No. of Poster	Affiliation	Name	Title of Research
G-1	Jomo Kenyatta University of Agriculture and Technology	Milton Utwolo Alwanga	Governance Reforms and Rural Electrification in Kenya
G-2	University of Technology Sydney	Joseph Wyndham	Ethics of algorithmic decision making on the grid
G-3	Université Catholique de Louvain	Jian Wang	Synthesis of Unsolvated MxB <sub>12</sub> H <sub>12</sub> (M=Na, K, Mg) by a Facile Autoclave Route
G-4	The University of Sheffield	Peng Luo	A Novel Dynamic Avalanche Free Super-Junction Trench Clustered IGBT for High Power Applications



INTERNATIONAL INSTITUTE FOR CARBON-NEUTRAL ENERGY RESEARCH

## I<sup>2</sup>CNER THRUST WORKSHOP: SCIENCE AND TECHNOLOGY FOR CARBON-NEUTRALITY

ADVANCED ENERGY MATERIALS THRUST (AEM),  
ADVANCED ENERGY CONVERSION SYSTEMS THRUST (AEC),  
AND MULTISCALE SCIENCE AND ENGINEERING FOR ENERGY AND THE ENVIRONMENT THRUST (MS3E)

DATE: JANUARY 22<sup>ND</sup>, 2021, FRIDAY

TIME: 11:00 PM – 02:00 AM (JST)

VENUE: VIRTUAL WORKSHOP VIA ZOOM

Time	Speaker	Affiliation	Title
<b>11:00-11:05</b>	Hiroshige Matsumoto	AEC, I <sup>2</sup> CNER	Opening Introduction
<b>Session 1: Advanced Energy Materials Thrust (AEM)</b>			
<b>11:05-11:35</b>	Masanobu Kubota	AEM, I <sup>2</sup> CNER	Collaborative research between University of Göttingen and I <sup>2</sup> CNER for mitigation of hydrogen embrittlement by impurities
	Lin Tian	Institute of Material Physics, University of Göttingen	
<b>11:35-11:45</b>	Takashi Fukushima	AEM, I <sup>2</sup> CNER	Electrosynthesis of amino acids from sustainable feedstocks
<b>11:45-12:00 (00:00 AM)</b>	Ki-Seok Yoon	AEM, I <sup>2</sup> CNER	Biocatalytic H <sub>2</sub> and CO <sub>2</sub> activation
<b>Session 2: Advanced Energy Conversion Systems Thrust (AEC)</b>			
<b>00:00-00:20</b>	Hong Yang	AECS, I <sup>2</sup> CNER/UIUC	Low- and Non-Platinum Group Metal Electrocatalysts for the Reduction of Oxygen
<b>00:20-00:40</b>	Stephen Skinner	AECS, I <sup>2</sup> CNER/ICL	Investigating the effects of humidity on ion transport in mixed conducting oxides
<b>00:40-01:00</b>	Koji Takahashi	AECS, I <sup>2</sup> CNER/Department of Aeronautics and Astronautics, Kyushu University	Towards reliable cooling technology from nanoscale transport phenomena
<b>Session 3: Multiscale Science and Engineering for Energy and the Environment Thrust (MS3E)</b>			



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<b>01:00-01:20</b>	Roman Selyanchyn	MS3E, I <sup>2</sup> CNER	Membrane-based Direct Air Capture for Fuel Production and Negative Emissions
<b>01:20-1:40</b>	Takeshi Tsuji	MS3E, I <sup>2</sup> CNER	Use Earth Toward Negative Emissions
<b>01:40-2:00</b>	Andrew Chapman	MS3E, I <sup>2</sup> CNER	Systematic Considerations for a Sustainable, Carbon Neutral Energy System

## Chikushi Symposium

<Date> 14:00-18:30, 25<sup>th</sup> January 2021  
 <Venue> I<sup>2</sup>CNER Hall, I<sup>2</sup>CNER Bldg. 1, Ito Campus, Kyushu University (Live streaming venue)  
 <Language> English  
 <Theme> **Aligning climate change and sustainable development policies in Asia: quantifying, integrating, and advancing co-benefits**

< Program and Speaker >

Time	Program and Speaker
14:00-14:10	<b>Welcoming Remarks</b> <i>Mr. Toshiyuki Yamasaki, Director, Office of International Cooperation in Air and Water Quality Management, Ministry of the Environment, Japan</i>
14:10-14:30	<b>Introductory Session</b> Co-benefits: Core Concepts and Applications <i>Dr. Eric Zusman, IGES, Japan</i>
14:30-15:30	<b>Session I: Quantitative Modeling of Climate co-benefits and Sustainable Development</b> - Integrated energy-environment-public health-economy assessment of the utilization of high-efficiency Heat Only Boilers in Ulaanbaatar, Mongolia <i>Assoc Prof. Hooman Farzaneh, Kyushu University, Japan</i> - Interactions between urban and rural air pollution in Asia, and the multiple development benefits of coordinated action <i>Dr. Zbigniew Klimont, International Institute for Applied Systems Analysis (IIASA), Austria</i> - Co-benefits of policies on market for energy efficiency and environment in Iran <i>Prof. Yadollah Saboohi, Sharif University of Technology, Tehran, Iran</i>
15:30-16:00	Short break
16:00-17:00	<b>Session 2: Co-benefits of Climate Change Mitigation Strategies</b> - Co-benefits of renewable energy policies in South Korea <i>Dr. Yeora Chae, Korea Environment Institute, South Korea</i> - Co-benefits of renewable energy policies in Japan <i>Dr. Etsujiro Takai, IGES, Japan</i> - Co-benefits of renewable energy policies in China <i>Prof. Mao Xianqiang, Beijing Normal University, China</i>
17:00-17:10	Short break
17:10-18:10	<b>Session 3: New Perspectives on Co-benefits</b> - Japan's low-carbon technology collaboration with Southeast Asia: Co-innovation and Co-benefits <i>Dr. Nanda Kmar Janardhanan, IGES, Japan</i> - Biodiversity Co-benefits: From Analytical to Action-Oriented Research <i>Dr. Kaoru Akahoshi, IGES, Japan</i> - Social co-benefits <i>Dr. So-Young Lee, IGES, Japan</i>
18:10-18:30	<b>Closing Remarks</b> <i>Assoc Prof. Hooman Farzaneh, Kyushu University, Japan</i> <i>Dr. Eric Zusman, IGES, Japan</i>



INTERNATIONAL INSTITUTE FOR CARBON-NEUTRAL ENERGY RESEARCH

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**ARTIFICIAL INTELLIGENCE FOR OPERATION AND MANAGEMENT  
OF ENERGY SYSTEMS**  
**I²CNER-IMI INTERNATIONAL WORKSHOP**

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**DATE: JANUARY 25, 2021**

**TIME: 8:40 AM – 13:20 PM (JAPAN TIME)**

**VENUE: ZOOM MEETING**

Time	Speaker	Affiliation	Title
8:40 – 8:45	Osamu Saeki	IMI, Kyushu University	Opening speech
8:45 – 9:30	Hideaki Ishii	Tokyo Institute of Technology, Japan	Resilient Control and Estimation of Power Grids under Cyber Attacks
9:30 – 10:15	Subhonmesh Bose	University of Illinois at Urbana-Champaign, USA	Risk-sensitive market design for the modern power system
10:15 – 11:00	Kei Hirose	IMI, Kyushu University	Event Effects Estimation on Electricity Load Forecasting
11:00 – 11:45	Thinh T. Doan	Virginia Tech, USA	Multi-agent multi-task reinforcement learning
11:45 – 12:30	Hung D. Nguyen	Nanyang Technological University, Singapore	Gaussian Process Learning for Power System Operation
12:30 – 13:15	Javad Khazaei	Penn State University, USA	Modeling and Detection of Cyber-Physical Attacks Aiming at Blackouts in Smart Grids
13:15 – 13:20	Nguyen Dinh Hoa	I²CNER and IMI, Kyushu University	Closing remarks



INTERNATIONAL INSTITUTE FOR CARBON-NEUTRAL ENERGY RESEARCH

**2021 I²CNER ANNUAL SYMPOSIUM:  
A VIRTUOUS CYCLE: EMBEDDING THE ENERGY  
TRANSITION IN POST-COVID-19 RECOVERY**

***Virtual Symposium***

**TUESDAY, JANUARY 26, 2021, 9:00AM -1:00PM**

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- 9:00 a.m.      Opening Remarks  
**Dr. Tatsuro Ishibashi**, *President, Kyushu University*  
**Dr. Toshio Kuroki**, *WPI Academy Director, Japan Society for the Promotion of Science*
- 9:10 a.m.      Introduction  
**Prof. Petros Sofronis**, *Director, I²CNER, Kyushu University*
- 9:20 a.m.      Invited Lecture A  
*"Presentation title: TBD"*  
**Mr. Keiji Hisata**, *Deputy Director, International Affairs Division, Agency for Natural Resources and Energy, Ministry of Economy, Trade and Industry, METI*
- 9:50 a.m.      Invited Lecture B  
*"U.S. Energy Policy in 2021 and Beyond"*  
**Mr. Ross Matzkin-Bridger**, *Energy Attaché and DOE Director, U.S. Embassy Tokyo*
- 10:20 a.m.     Invited Lecture C  
*"Scenarios of a Sustainable Energy Transition: Perspectives from the U.S."*  
**Dr. Jill Engel-Cox**, *Director, Joint Institute for Strategic Energy Analysis, National Renewable Energy Laboratory, U. S.*
- 11:00 a.m.     Invited Lecture D  
*"Trade and tribulations: the reshaping of Australia's energy supply sector during COVID-19"*

**Prof. Benjamin McLellan**, *Graduate School of Energy Science, Kyoto University and Research Fellow at Sustainable Minerals Institute, University of Queensland*

11:40 a.m. **One-minute presentations by I<sup>2</sup>CNER young researchers**

12:00 a.m. Invited Lecture E TBD

12:40 a.m. Wrap up  
**Prof. Andrew Chapman**, *I<sup>2</sup>CNER, Kyushu University*

**MCs: Profs. Dino Klotz and Yukina Takahashi**, *I<sup>2</sup>CNER*

## 九州水素・燃料電池フォーラム & 水素先端世界フォーラム 2021

<開催日時> 2021年1月28日 13:00- 16:15

<配信方法> オンライン配信 (You Tube Live)

< 言 語 > 日本語

< プログラム & 講演者 >

時間	九州水素・燃料電池フォーラム 2021 プログラム・講演者
13:00-13:10	<b>主催挨拶:</b> 経済産業省 九州経済産業局 米田健三 局長 福岡水素エネルギー戦略会議 顧問 小川洋 福岡県知事
13:10-13:40	<b>基調講演:</b> "グリーンイノベーションにおける水素と九州の役割 <仮> " 国立大学法人九州大学 副学長 兼 水素エネルギー国際研究センター長 佐々木一成 教授"
13:40-14:10	施策説明: "水素社会実現に向けた経済産業省の取組 <仮> " 経済産業省 資源エネルギー庁省エネルギー・新エネルギー部 省エネルギー・新エネルギー部 新エネルギーシステム課
14:10-14:40	<b>ドキュメント動画:</b> 九州の水素エネルギー産業化の取組事例紹介 <仮> ※映像コンテンツ配信"
14:40-14:50	<b>質疑応答</b>
時間	水素先端世界フォーラム 2021 プログラム・講演者
15:00-15:15	<b>講演 1</b> 燃料電池・水素分野における国家プロジェクトの取組について 国立研究開発法人新エネルギー・産業技術総合開発機構 次世代電池・水素部 原 大周 主任研究員
15:15-15:45	<b>講演 2</b> "水素社会構築に向けて～HYDROGENIUS の 15 年と今後の展開" 国立大学法人九州大学 水素材料先端科学研究センター センター長 杉村 丈一 教授
15:45-16:15	<b>質疑応答</b>

**- HYDROGEN-MATERIALS INTERACTIONS -**  
**HYDROGENIUS, I<sup>2</sup>CNER, AND HYDROMATE JOINT RESEARCH SYMPOSIUM 2021**  
**HYDROGENIUS FATIGUE AND FRACTURE DIVISION,**  
**I<sup>2</sup>CNER HYDROGEN MATERIALS COMPATIBILITY DIVISION,**  
**& HYDROMATE**

< Date and hour > January 28<sup>th</sup>, 21:00—24:00 (Japan time)  
 January 29<sup>th</sup>, 21:00—24:00 (Japan time)  
 < Venue > Online (ZOOM Webiner)  
 < Language > English

< Program, January 28<sup>th</sup>, 21:00—24:00 >

Time	Presentation Title and Speaker
21:00-21:10	<b>Opening Remarks</b> Hisao Matsunaga (Kyushu University, Japan)
21:10-21:50	<b>Invited talk 1:</b> The Synergistic Action of HELP and HEDE Mechanisms of Hydrogen Embrittlement in Steels Milos B. Djukic (University of Belgrade, Serbia)
21:50-22:30	<b>Invited talk 2:</b> Study on Low Cycle Fatigue Property for a Hydrogen Pre-charged to 316L Stainless Steel Un-Bong Baek (KRISS, Korea)
22:30-22:40	Break
22:40-23:20	<b>Invited talk 3:</b> Hydrogen Influence on Mechanical Properties and Microstructure in Pipeline Steels for Subsea Hydrogen Gas Transport Anette Brocks Hagen (SINTEF, Norway)
23:20-24:00	<b>Invited talk 4:</b> Atomistic Simulation Activities at Sandia Xiaowang Zhou (Sandia National Laboratories, USA)

< Program, January 29<sup>th</sup>, 21:00—24:00 >

Time	Presentation Title and Speaker
21:00-21:40	<b>Invited talk 5:</b> Opening New Horizons in the Prediction of Hydrogen Embrittlement: Multi-physics Phase Field Fracture Emilio Martínez-Pañeda (Imperial College London, UK)
21:40-22:20	<b>Invited talk 6:</b> Scanning Kelvin Probe Force Microscopy Study on Hydrogen Distribution in Austenitic Stainless Steel Zhengli Hua (Zhejiang University, China)
22:20-22:30	Break
22:30-23:10	<b>Invited talk 7:</b> Hydrogen-induced Ductility-loss Accompanied with Intergranular Fracture in Pure Ni and Cu-Ni binary alloy Kentaro Wada (Fukuoka University, Japan)
23:10-23:50	<b>Invited talk 8:</b> Macroscale-based Approaches for Assessing the Influence of Hydrogen on the Deformation Behavior of Polycrystalline Ni Zachary D. Harris (University of Virginia, USA)
23:50-24:00	<b>Closing Remarks</b> Brian Somerday (University of Illinois at Urbana-Champaign, USA)

**-2021 HYDROGENIUS & I<sup>2</sup>CNER TRIBOLOGY SYMPOSIUM -**  
**HYDROGENIUS AND I<sup>2</sup>CNER JOINT RESEARCH SYMPOSIUM**  
**(HYDROGENIUS TRIBOLOGY DIVISION AND**  
**I<sup>2</sup>CNER ADVANCED ENERGY MATERIALS THRUST)**

<Date> 9:55-17:20, 29<sup>th</sup> January 2021  
 < Venue > Online (ZOOM Meeting) and Centennial Hall, Kyushu University  
 < Language > English

< Program and Speaker >

Time	Program and Speaker
09:55-10:00	Opening Remarks
10:00-10:40	<b>Invited Lecture 1:</b> Effects of transition metals on low friction of DLC coatings Dr. Hiroyoshi Tanaka, Kyushu University (Japan)
10:40-11:20	<b>Invited Lecture 2:</b> Formation of anti-oxidation nano layer under carbon transfer film during unlubricated friction between a-C:H:Si and steel balls Prof. Hiroyuki Kosaka, Gifu University (Japan)
11:20-12:00	<b>Invited Lecture 3:</b> The tribology of 2D materials under inert atmospheres Dr. Prabakaran Saravanan, Birla Institute of Technology & Science, Pilani (India)
12:00-13:30	Lunch Break
13:30-14:10	<b>Invited Lecture 4:</b> Towards the realization of sustainable hydrogen economy: from fundamental research to practical applications Dr. Akihide Nagao, Air Liquide Laboratories/Kyushu University (Japan)
14:10-14:50	<b>Invited Lecture 5:</b> Heat generation modeling of cryogenic ball bearings for LH2 rocket-engine turbopump Dr. Hiromitsu Kakudo, Dr Satoshi Takada, JAXA (Japan)
14:50-15:30	<b>Invited Lecture 6:</b> Effect of fillers on friction and wear of PTFE composites in high purity hydrogen gas Prof. Yoshinori Sawae, Kyushu University (Japan)
15:30-15:50	Coffee Break
15:50-16:30	<b>Invited Lecture 7:</b> Phenolic resin composite material for applying to highly loaded sliding parts Prof. Yoshinori Takeichi, Toyohashi University of Technology (Japan)
16:30-17:10	<b>Keynote Lecture :</b> Influence of the counterface on the sliding behavior of polymer materials in hydrogen Dr. Géraldine Theiler, BAM (Germany)
17:10-17:20	Closing Remarks



## International Symposium of Hydrogen Polymers Team, HYDROGENIUS

<Date> 9:45-17:00, 29<sup>th</sup> January 2021  
 < Venue > Online (ZOOM Meeting) and Centennial Hall, Kyushu University  
 < Language > English

< Program and Speaker >

Time	Program and Speaker
09:45-10:00	Opening Remarks <b>Prof. Shin NISHIMURA, Kyushu University (Japan)</b>
10:00-10:50	H-Mat Materials Characterization, Testing, and Modeling. <b>Dr. Kevin SIMMONS, Pacific Northwest National Laboratory (USA)</b>
11:00-11:50	High-Pressure Hydrogen Polymeric Material Test Facilities in Kyushu University <b>Prof. Shin NISHIMURA, Kyushu University (Japan)</b>
11:50-14:00	Break
14:00-14:50	Update of Type IV tank in China <b>Prof. Jinyang ZHENG, Zhejiang University (China)</b>
15:00-15:50	Update of behavior of polyamide in high-pressure hydrogen <b>Dr. Hiroaki ONO, Kyushu University (Japan)</b>
16:00-16:50	Overview of studies on type IV hyperbaric tanks : burst resistance, damage tolerance, fire exposure and liner collapse <b>Prof. Damien HALM, ENSMA (France)</b>
16:50-17:00	Closing Remarks <b>Prof. Shin NISHIMURA, Kyushu University (Japan)</b>

### Local Time for the symposium

29 JAN 9:45-17:00 JST : Japan  
     11:00-11:50 JST Shin Nishimura  
     15:00-15:50 JST Hiroaki Ono  
 29 JAN 8:45-16:00 CST : China  
     13:00-1350 CST Prof. Jinyang Zheng  
 29 JAN 1:45-9:00 CET : France  
     8:00-8:50 CET Prof. Damien Halm  
 28 JAN 16:45-23:50 PST : WA, US  
     17:00-17:50 PST : Dr. Kevin Simmons

**< Kyushu University COI >**

**<Center of Coevolutionary Research for Sustainable Communities (C<sup>2</sup>RSC) Symposium >**

<Date> 13:00-16:30, March 3<sup>rd</sup>, 2021

<Venue> Online (ZOOM Webinar)

<Language> Japanese

<Theme> "Creation of a safe, active, and vibrant community toward the new normal era  
 ~Revitalizing the local economy through locally generated and consumed energy and creating sustainable mobility and ICT monitoring services~"

Time	Program and Speaker
13:00-13:10	<b><u>Opening Remarks</u></b>
13:10-13:20	<b><u>Overview of Kyushu University COI</u></b> Dr. Yuichi Nakamura, Project Leader, Kyushu University COI (C <sup>2</sup> RSC), Executive Professional, NEC Corp.
13:20-13:30	<b><u>Overview of research themes for social implementation</u></b> Prof. Yasuhide Fukumoto, Research Leader, Kyushu University COI (C <sup>2</sup> RSC), Professor, Institute of Mathematics for Industry, Kyushu Univ.
13:30-14:10	<b><u>Special Lecture</u></b> TBD
14:10-14:20	<b><u>Break</u></b>
14:20-15:40	<b><u>The initiatives and research themes for social implementation in each field</u></b> ● Sustainable Mobility ● ICT Monitoring ● Locally generated and consumed energy ● Utilization of Math for Industry
15:40-16:25	<b><u>Overall discussion</u></b> Moderator: Dr. Yuichi Nakamura (Project Leader, Kyushu University COI (C <sup>2</sup> RSC))
16:25-16:30	<b><u>Closing Remarks</u></b> Prof. Yoshio Hisaeda, Director, Kyushu University COI (C <sup>2</sup> RSC), Executive Vice President, Kyushu University

※The program is subject to change.