

Call for Papers

The 9th Asia-Pacific Workshop on Widegap Semiconductors (APWS2019)



November 10-15, 2019, Okinawa, Japan

Okinawa Kariyushi Urban Resort Hotel (Naha, November 10)

**Okinawa Institute of Science and Technology Graduate University (OIST)
(Onna-son, November 11-15)**

Abstract deadline: June 14, 2019

<http://www.apws2019.jp/>

Sponsored by



The 162nd Committee on Wide Bandgap Semiconductor Photonic and Electronic Devices, Japan Society for the Promotion of Science

Co-sponsored by



“Materials Science and Advanced Electronics Created by Singularity”,
MEXT-KAKENHI on Innovative Areas, FY2016-2020



Okinawa Institute of Science and Technology Graduate University
(OIST)

Endorsed by



The Japan Society of Applied Physics



The Japanese Association for Crystal Growth

Important dates

- Deadline for abstracts: **June 14, 2019**
- Deadline for early registration: **September 27, 2019**
- Workshop dates: **November 10-15, 2019**

Program at a glance

	Nov. 10 (Sun)	Nov. 11 (Mon)	Nov. 12 (Tue)	Nov. 13 (Wed)	Nov. 14 (Thu)	Nov. 15 (Fri)	
8:00		Gathering and transit to OIST	Registration	Registration	Registration	Transit to Naha and Departure	
9:00		Plenary Session	Plenary Session	Parallel Session	Parallel Session		
10:00			Break	Break	Break		
11:00		Single Session	Parallel Session	Parallel Session			
12:00		Lunch and Poster	Excursion	Excursion	Lunch and Poster		
13:00		Parallel Session			Parallel Session		Parallel Session
14:00		Break			Break		Break
15:00		Parallel Session			Parallel Session		Parallel Session
16:00		Parallel Session	Parallel Session	Parallel Session	Plenary Session Closing Session	Banquet	
17:00	Registration	Parallel Session	Parallel Session	Parallel Session	Transit		
18:00	Opening Session and Welcome Reception						
19:00							
20:00							
Site	Okinawa Kariyushi Urban Resort Naha (Naha)	OIST (Onna-son)					

- Registration and welcome reception on November 10 will be held in Naha.
- Chartered buses will transport the participants from Kariyushi Urban Resort Naha to OIST at around 8:30 on November 11.
- Chartered buses will transport the participants from Rizzan Sea Park Hotel to Naha Airport in the morning on November 15.

Workshop scope

The 9th Asia-Pacific Workshop on Widegap Semiconductors (APWS2019) will be held in Onnason, Okinawa, Japan from November 10 to 15, 2019. The previous eight workshops were held in Awajishima, Japan (APWS2003), Hsinchu, Taiwan (APWS2005), Jeonju, Korea (APWS2007), Zhangjiajie, China (APWS2009), Toba, Japan (APWS2011), New Taipei, Taiwan (APWS2013), Seoul, Korea (APWS2015), and Qingdao, China (APWS2017). Researchers from the Asia and Pacific region will join those from other parts of the world in stimulating discussions on widegap semiconductors.

Widegap semiconductors, including III-nitrides, silicon carbide, oxides, and diamond, have excellent physical properties. There are many obstacles on the road to high-performance optical and electronic devices, including difficulties in epitaxy and device processing. The objective of this workshop is to share high-level research results, spread the understanding of widegap semiconductors through in-depth discussions, and contribute to breakthroughs that can overcome critical technological barriers to improve the performance of widegap semiconductor devices.

Workshop format

APWS2019 consists of plenary sessions and a series of three parallel oral sessions that include invited and contributed presentations, as well as poster sessions, an excursion, a banquet, and industrial exhibitions.

Workshop topics

APWS2019 focuses on the science and technology of widegap semiconductors, including III-nitrides, silicon carbide, oxides, diamond and so forth. Research has led to developments in optical and electronic devices, including those for environmental and energy applications. The following topics will be discussed:

✓ Growth

Bulk growth, epitaxial growth, doping and point defects, growth methods, and related technology

✓ Characterization

Optical and electrical properties, structural analysis, and theory and simulation

✓ Optical Devices

Visible, UV, and white LEDs, micro LEDs, laser diodes, solar cells, detectors, and related optical devices

✓ Electronic Devices

Transistors, diodes, high-power and high-frequency devices, device processing, contacts, and reliability

Abstract submission

Abstract Deadline: June 14, 2019

Authors are asked to submit their abstracts via the submission form at <http://www.apws2019.jp>. Detailed information regarding abstract formatting can be found on the website.

Plenary and invited speakers

Plenary speakers

Hiroshi Amano (Nagoya Univ., Japan)

“Wide-bandgap semiconductors as key materials in realizing zero emission of greenhouse gases”

Euijoon Yoon (Seoul National Univ., Korea)

“Self-passivated high-efficiency micro-LEDs using sapphire nano-membrane technology”

Bo Shen (Peking Univ., China)

TBA

Hideo Hosono (Tokyo Inst. Tech., Japan)

“Material designing novel wide gap semiconductors”

Tsutomu Miyasaka (Toin Univ. Yokohama, Japan)

“Progress of halide perovskite semiconductors in high performance photovoltaics”

Invited speakers

Hajime Fujikura (SCIOCS, Japan)

“HVPE for GaN and AlN epi-layer growth”

Yutaka Mikawa (Mitsubishi Chemical, Japan)

“Acidic Ammonothermal Growth of Bulk GaN”

Jianfeng Wang (Suzhou Inst. of Nano-tech and Nanobionics, China)

“Bulk GaN substrate growth by HVPE technology for GaN-on-GaN devices”

Michal Bockowski (UNIPRESS/Nagoya Univ., Poland)

“Bulk growth of GaN. How to overcome the equilibrium crystal shape?”

Hideto Miyake (Mie Univ., Japan)

“Progress on high-temperature-annealed AlN/sapphire for deep ultraviolet LED”

Motoaki Iwaya (Meijo Univ., Japan)

“Demonstration of high current density operation in UV-B emitters with high Al-content AlGaIn cladding layer for realizing deep-UV laser diodes”

Susumu Noda and Menaka De Zoysa (Kyoto Univ., Japan)

“High-Brightness Photonic-Crystal Lasers and Their Extension to Nitride Semiconductor Systems”

Tim Wernicke (Technical University of Berlin)

“Growth and characterization of AlGaIn based UV-emitters”

Jin Min Li (Inst. of Semiconductors, Chinese Academy of Science, China)

“The R&D and Industry Progress of Ultraviolet LED”

Okhyun Nam (Korea Polytechnic Univ., Korea)
 “Growth and characterization of widegap III-nitride based optoelectronic and electronic devices”

Yong Hoon Cho (KAIST, Korea)
 “Group III-nitride semiconductor nanostructures for novel classical and quantum photonic device applications”

Kei May Lau (Hong Kong Univ. of Sci. & Tech., China)
 TBA

Chih Chung Yang (National Taiwan Univ., Taiwan)
 “Enhancement of LED color conversion efficiency through surface plasmon coupling”

Yun-Li Li (PlayNitride, Taiwan)
 TBA

Shinya Takashima (Fuji Electric, Japan)
 “Demonstration of vertical GaN planar MOSFET fabricated by all ion implantation process”

Kevin Chen (Hong Kong Univ. of Sci. & Tech., China)
 “GaN integration for power conversion”

Yang Shu (Zhejiang Univ., China)
 “Dynamic performance and surge current capability of vertical GaN-on-GaN power devices”

Shinsuke Harada (AIST, Japan)
 “Outstanding potential of SiC superjunction MOSFET as a next generation 1.2 kV-class power transistor”

Noboru Ohtani (Kwansei Gakuin Univ., Japan)
 “Development of 4H-SiC single crystal substrates for power device applications”

Nam Kyun Kim (KERI, Korea)
 “Development of SiC power devices with low on-resistance”

Yoshinao Kumagai (Tokyo Univ. Agr. & Tech., Japan)
 “Investigation of homoepitaxial growth of β -Ga₂O₃ by halide vapor phase epitaxy for the preparation of epitaxial wafers for vertical power device fabrication”

Hong Zhou (Xidian Univ., China)
 “Ga₂O₃ power device potential investigation based on its nano-membrane channel”

Tsubasa Matsumoto (Kanazawa Univ., Japan)
 “Recent progress of inversion channel diamond MOSFET”

Shinya Ohmagari (AIST, Japan)
 “Large reduction of threading dislocations in diamond by metal-assisted termination (MAT) technique”

Tomoyuki Tanikawa (Osaka Univ., Japan)
 “Nondestructive defect characterization of widegap semiconductors using multiphoton-excitation photoluminescence”

Mathias Schubert (Univ. of Nebraska-Lincoln, USA)
 “Phonons, free charge carriers, excitons and band-to-band transitions in β -Ga₂O₃ and related alloys determined by ellipsometry and optical Hall effect”

Takeyoshi Onuma (Kogakuin Univ., Japan)
 “Deep UV cathodoluminescence properties of rocksalt-structured MgZnO alloys”

Social activities

1. Opening session and welcome reception

Sunday evening, Nov. 10, 2019

An opening session and welcome reception will be held at Okinawa Kariyushi Urban Resort Naha. All participants and accompanying persons are invited to attend the reception free of charge.

2. Excursion

Wednesday afternoon, Nov. 13, 2019

The workshop will organize a tour to Okinawa Churaumi Aquarium, the second largest aquarium in the world. After the tour, a dinner including barbecue will be served in Rizzan Sea Park hotel, which is in front of the beautiful sea coast. The excursion is optional and requires booking when registering through the website.



3. Banquet

Thursday evening, Nov. 14, 2019

A workshop banquet will be held at ANA Intercontinental Manza Beach Resort. The banquet is optional and must be booked when registering through the website.

Registration

All attendees and presenters of contributed papers are subject to the relevant registration fees.

Category	Early	Normal	On site
	Until Sept. 27	Sept. 28 -Oct. 27	
General	50,000 JPY (~435 US\$)	70,000 JPY (~610 US\$)	80,000 JPY (~696 US\$)
Student	25,000 JPY (~220 US\$)	35,000 JPY (~305 US\$)	40,000 JPY (~348 US\$)
Exhibitor	40,000 JPY (~350 US\$)	50,000 JPY (~435 US\$)	
Accompanying person	11,000 JPY (~95 US\$)	13,000 JPY (~110 US\$)	
Banquet	8,000 JPY (~70 US\$)		
Excursion	3,000 JPY (~26 US\$)		

An exchange rate of 115 JPY/US\$ was used.

- General and student registration fees include:
 - Admittance of all technical sessions.
 - Conference packets, including the technical digest.
 - Admittance of the welcome reception.
- Exhibitor registration fee is for those who plan to exhibit at the workshop.
- Accompanying person fee includes admittance of the welcome reception, banquet, and excursion.
- Registration fees do not include lunch.
- Accompanying persons cannot participate in any technical sessions.

Payment

Online payment will be accepted via credit card (VISA, Master, AMEX, and JCB only). Limited on-site registration will be available; however, we recommend paying online in advance. All payments must be made in **Japanese yen**.

Cancellation

In the case of cancellation, the registrant should notify the registration desk using the cancellation form provided on the workshop website. The following cancellation fees apply:

Before Sept. 27, 2019: 5,000 JPY

On/after Sept. 28, 2019: 100% of the registration fee (no refund)

Passport and visa

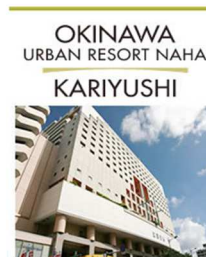
All foreign visitors entering Japan must possess a valid passport. Participants from countries requiring a visa to enter Japan should obtain one from the nearest Japanese embassy or consulate. If documents issued by the workshop committee are necessary for the visa application (e.g., an invitation letter), please contact Art Tourist, which is the official travel agency for

APWS2019. Further details will be provided on the workshop website.

Accommodation

Participants are encouraged to stay in Naha on Nov. 10 for the welcome reception and in Onna-son on Nov. 11-15 for the workshop sessions. A limited number of rooms have been secured at local hotels (e.g., Okinawa Kariyushi Urban Resort Naha, Rizzan Sea-Park Hotel). Participants may also make their own reservations at any of the many hotels near the workshop venue (see below).

November 10 (Sun)

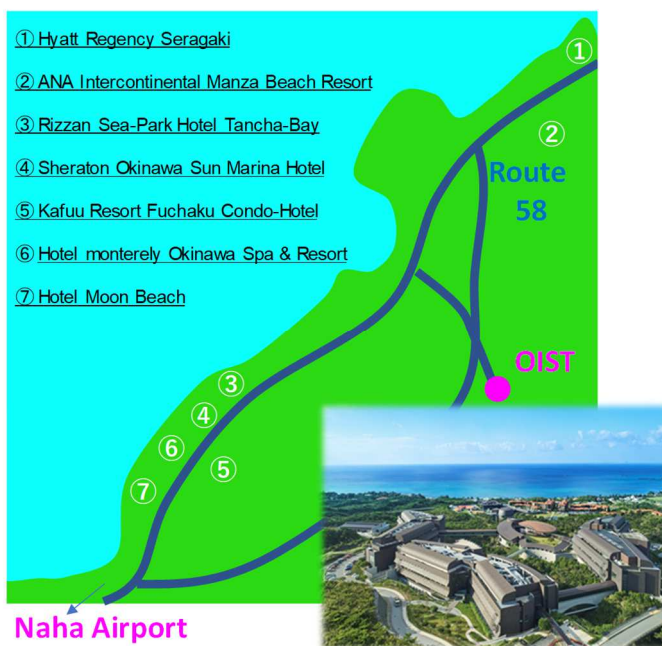


Other Hotels

- ① Smile Hotel Okinawa Naha
- ② Hotel AQUA CITTA Naha by WBF
- ③ Route Inn Hotels
- ④ Richmond Hotel Naha Kumoji
- ⑤ Hotel JAL City Naha



November 11 (Mon)-15 (Fri)



Shuttle buses will transport participants between Rizzan Sea Park Hotel (“3” on map) and OIST on November 11-14.

Official registration desk

Art Tourist is the official travel agency during the workshop and will handle registration, VISA applications, and hotel accommodations.

ART TOURIST CO., LTD

Tel.: +81-75-252-2234, Fax: +81-75-252-2244

E-mail: apws2019@art-tourist.co.jp

Exhibition and sponsorship

Sponsorships, exhibitors, and advertisements are welcome at APWS2019. The exhibition will take place on Nov. 11-15 (tentative dates). We expect more than 350 participants to attend, including academics, industrial researchers, and students from all over the world, mostly from the Asia and Pacific region. We offer a wide range of sponsorship opportunities for companies who want to increase their visibility both prior to and during the workshop. The exhibition fee is 150,000 JPY, which includes the exhibition and exhibitor registration fees for two people. Additional registration fees will be required for each exhibitor beyond two exhibitors. Further information can be found on the workshop website.

Dr. Yoshio Honda

(Secretary of Exhibition and Sponsorship)

Institute of Material and Systems for Sustainability,
Nagoya University

Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan

Tel.: +81-52-789-5275

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Venue

Okinawa is one of the 47 prefectures of Japan. It is comprised of over 160 islands, 47 of which are inhabited. Okinawa Island is the largest in Okinawa prefecture. The island is approximately 110 km long and on average 11 km wide. By taking advantage of our geographic location - the closest region in Japan to Southeast Asian countries - as well as our experience with cultural exchanges that we have cultivated with other countries, we are striving to develop an open region to serve as the center for international exchanges.

Okinawa is different from other prefectures in Japan, with its unique history, food, art, and beautiful ocean. Through this workshop, participants can enjoy both urban areas (near Okinawa Kariyushi Urban Resort Naha) and a beautiful ocean (near OIST). Kokusai street is a popular place near Okinawa Kariyushi Urban Resort Naha. It is home to about 600 shops, including department stores, restaurants, accessory shops, hotels, and souvenir stores. For more details, please visit [Three small images illustrating Okinawa's unique history, culture, and food. The first image shows a traditional red wooden gate with a sign that says "Unique history". The second image shows a busy street scene with a sign that says "Unique culture". The third image shows a bowl of food with a sign that says "Unique food".](https://naha-</p></div><div data-bbox=)



Multicultural "Kokusai Street"



Beautiful beach and capes in Onna-son

kokusaidori.okinawa/en/. Starting on the second day of this workshop, participants will see the beautiful sea of Okinawa in Onna-son. There are many beautiful beaches and capes in Onna-son.

November is a very convenient season for visiting Okinawa. The average temperature is about 24 °C and rainfall is relatively low. The average sea water temperature is 26 °C, which is perfect for swimming.

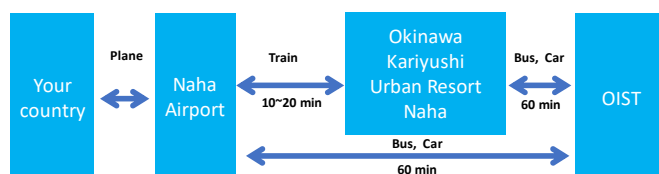
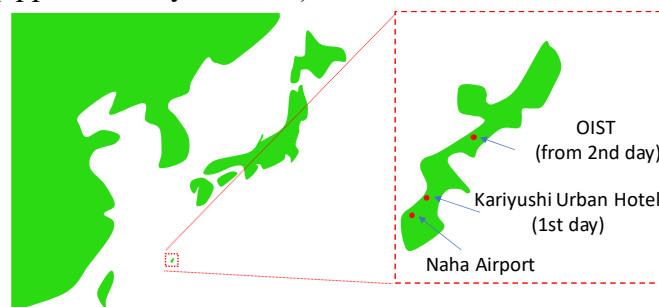
For more about Okinawa and preparations for an Okinawa visit, please visit:

<https://www.visitokinawa.jp/>

<https://www.pref.okinawa.lg.jp/site/chijiko/kohokoryu/foreign/english/index.html>

Transportation

Okinawa (Naha) can only be reached by flight from abroad. Naha is accessible from Tokyo (approximately 160 min).



From Naha Airport to Okinawa Kariyushi Urban Resort Naha:

Take the train (Yui Rail) from Naha Airport Station to Miebashi Station. It is 10 minutes by foot from Miebashi Station to Okinawa Kariyushi Urban Resort Naha.

From Okinawa Kariyushi Urban Resort Naha to OIST:

The most convenient way is to take the shuttle bus arranged for APWS2019. Please come to the front lobby of Okinawa Kariyushi Urban Resort Naha at 8:30 on November 11.

From Naha Airport to OIST:

There are no trains or direct buses between Naha Airport and OIST. There are several ways to travel between airport and OIST by taking buses.

Please visit

<https://www.oist.jp/directions-southern-okinawa>

for details. One can also take a taxi (~10,000 JPY).

Further information

Please visit <http://www.apws2019.jp> for details on registration, abstract submission, and other information. Please contact the APWS2019 secretariat (E-mail: secretary@apws2019.jp)

Workshop committees

General committee

Honorary chair: Akihiro Yoshikawa (Chiba Univ., Japan)

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Special thanks

➤ Okinawa Prefecture