

# 2024 8th International Workshop on Low Temperature Bonding for 3D Integration

October 29, Tuesday

16:00	REGISTRATION (2F Reception Hall1/Corridor)
17:00	WELCOME DRINK (2F Reception Hall1/Corridor)

October 30, Wednesday

9:00	REGISTRATION			
9:30	Surface Activatged Bonding (I)	300-01	(OPENING REMARKS) [Keynote] Recent Progress in Surface Activated Bonding for 3D and Heterogenous Integration Tadatomo Suga, Meisei University	Chairs: Naoteru Shigekawa Takehito Shimatsu
10:00		300-02	Surface Activated Cu/SiO2 hybrid bonding for room temperature 3D integration Karine Abadie, University Grenoble Alpes, CEA-Leti	
10:15		300-03	Cross-sectional Investigation by Dual Bias Modulation Electrostatic Force Microscopy on n-type Si/Si Junction Fabricated by Surface-activated Bonding Daichi Kobayashi, Institute of Industrial Science, The University of Tokyo	
10:30		300-04	Application of surface activated bonding to determine the dislocation generation process at asymmetric grain boundaries in silicon Yutaka Ohno, Tohoku University	
10:45-11:15	BREAK			
11:15	Surface Activatged Bonding (II)	300-05	[Invite] Ga2O3-Diamond heterogeneous bonding at room temperature and interfacial thermal stress evaluation Hongyue Li, Institute of Microelectronics, Chinese Academy of Sciences	Chairs: Chenxi Wang Yutaka Ohno
11:40		300-06	Integrating Polycrystalline Diamond with Si for Enhanced Thermal Management in Large-Scale Integration Jianbo Liang, Osaka Metropolitan University	
11:55		300-07	Preparation of GaN-HEMTs devices bonded to 150µm thick diamond substrate Yusuke Shirayanagi, Mitsubishi Electric Corporation	
12:10		300-08	Performance Optimization of Gigawatt-Class DFC-PowerChip Laser System Through Bonding Technology Arvydas Kausas, RIKEN SPring-8 Center	
12:25-13:30	LUNCH			
13:30	Hybrid Bonding and 3D Integration(I)	300-09	[Invite] Bonding for Advanced 3D Logic Devices Serena Iacovo, IMEC	Chairs: Frank Fournel Fumihito Inoue
13:55		300-10	[Invite] Low-Thermal Budget TEOS-TEOS Bonding for Multi-stack HBM Applications Hemant Kumar Cheemalamarri, Institue of Microelectronics, A*STAR	
14:20		300-11	[Invite] Evolution of stacked image-sensor and Cu-Cu hybrid bonding technology Nobutoshi Fujii, Sony Semiconductor Solutions Corporation	
14:45		300-12	Novel IR Laser Release Temporary Bonding Solution for Advanced 3D stacking and Layer Transfer Peter Urban, EV Group	
15:00		300-13	Wafer-to-Wafer Bonding for Advanced Manufacturing Nodes Thomas Plach, EV Group	
15:15		300-14	Is NaOH beneficial to low temperature hybrid bonding integration? Hadi Hijazi, University Grenoble Alpes, CEA-Leti	
15:30-16:00	BREAK			
16:00-17:00	Short presentation for poster (I)			MC: Hideki Takagi Masahisa Fujino
17:00-18:00	Poster Session (I)			
GAGAKU WORKSHOP and RECEPTION				

**October 31, Thursday**

9:30	<i>Hybrid Bonding and 3D Integration(II)</i>	310-01	<b>[Invite]</b> Die-to-Wafer Bonding for Heterogenous Integration Viorel Dragoi, EV Group	Chairs: Masahisa Fujino Nobutoshi Fujii
9:55		310-02	<b>[Invite]</b> The Interactions between Formic Acid Vapor and Metallic Surface Jenn-Ming Song, National Chung Hsing University	
10:20		310-03	Effect of Microstructures on Thermal Expansion of Cu pads in SiO2 Vias for 3D IC Hybrid Bonding Pin-Lin Chen, National Yang Ming Chiao Tung University	
10:35		310-04	All-rounder hybrid bond-cluster for wafer to wafer and Co/Seq die to wafer, room temperature assemblies Philippe Muller, SUSS MicroTec Solutions GmbH & Co. KG	
10:50-11:20	<i>BREAK</i>			
11:20	<i>Power Device Applications (I)</i>	310-05	<b>[Keynote]</b> Review of Wafer Bonding for High Power Device Applications Karl Hobart, US Naval Research Laboratory	Chairs: Jenn-Ming Song Takashi Matsumae
12:00		310-06	<b>[Invite]</b> Wafer Bonding enabling engineered substrates for large application portfolio Christophe Maleville, Soitec	
12:25		310-07	Reliability of Full-Face Diffusion Bonding with Ag Coated Al Foil under Thermal Stress Oji Sato, ROHM Co., Ltd.	
12:40-13:50	<i>LUNCH</i>			
13:50-14:50	<i>Short presentation for poster (II)</i>			MC: Hideki Takagi Masahisa Fujino
14:50-15:50	<i>Poster Session (II)</i>			
15:50-16:20	<i>BREAK</i>			
16:20	<i>Power Device Applications (II)</i>	310-08	<b>[Invite]</b> Development of single diamond substrate and devices Hong-Xing Wang, Xi'an Jiaotong University	Chairs: Karl Hobart Jianbo Liang
16:45		310-09	<b>[Invite]</b> Thermal boundary resistance of bonded semiconductor interfaces Zhe Cheng, Peking University	
17:10			<b>[Keynote]</b> Integration of Diamond with GaN and Gallium Oxide Martin Kuball, University of Bristol	
	<i>BANQUET</i>			

**November 1, Friday**

<b>November 1, Friday</b>				
9:30	<i>MEMS, RF, and New Applidations</i>	01O-01	<b>[Invite]</b> The Use of Glasses in Low-Temperature Wafer Bonding Processes Roy Knechtel, Schmalkalden University of Applied Sciences	Chairs: Minoru Sasaki Ryo Takigawa
9:55		01O-02	Direct bonding using HfO2 as dielectric Sander Grosemans, IMEC	
10:10		01O-03	Withdrawn	
10:25		01O-04	Molecular direct bonding and transfer of 2D MoS2 layer over a full 200 mm silicon wafer. Frank Fournel, University Grenoble Alpes, CEA-Leti	
10:40-11:10	<i>BREAK</i>			
11:10	<i>New Method for Low Temperature Bonding</i>	01O-05	<b>[Invite]</b> Bonding Potential of Atomic Diffusion Bonding of Wafers Using Oxide Films Takehito Shimatsu, Tohoku University	Chairs: Viorel Dragoi Noriaki Toyoda
11:35		01O-06	Atomic Diffusion Bonding using SiN films Arina Muraoka, Canon ANELVA Corporation	
11:50		01O-07	Atomic Diffusion Bonding of Wafers with PDC-SiO2 underlayers using Thin Zr Films Miyuki Uomoto, Tohoku University	
12:05		01O-08	Investigation of Low Temperature Cu/Cu Wafer Bonding for Hybrid Bonding Applications Junsha Wang, The University of Tokyo	
12:20		01O-09	Perhydropolysilazane as an Adhesion Layer for Vacuum Sealing Wafer Bonding Kai Takeuchi, Tohoku University	
12:35-13:40	<i>LUNCH</i>			
13:40	<i>Hydrophilic Bonding and Fundamentals</i>	01O-10	<b>[Invite]</b> Wafer-Level InP to Si and LiNbO3 Covalent Bonding via Asymmetric Plasma Activation Strategy Chenxi Wang, Harbin Institute of Technology	Chairs: Serena Iacovo Kai Takeuchi Tadatomo Suga
14:05		01O-11	New insights of junction group states modified by surface activation in interlayer dielectrics Hideki Shimizu, Osaka University,	
14:20		01O-12	Correlation between Pre-Bonding Surface and Bond Wave Speed Ryosuke Sato, Yokohama National University	
14:35		01O-13	TEOS and thermal oxide low temperature direct wafer bonding dynamics Laurent Gaetan Michaud, EV Group	
14:50		01O-14	<b>[Keynote]</b> Recent developments on hydrophilic and hybrid direct bonding mechanism. Frank Fournel, Univeristy Grenoble Alpes, CEA-Leti	
15:30		01O-15	<b>[Invite]</b> Comprehensive Wafer Bond Strength Measurement: Fundamentals to Industry Standards Fumihito Inoue, Yokohama National University	
15:50-16:00	<i>SHORT BREAK</i>			
16:00-16:15	<i>Closing Session</i>			

*Poster Session (I)*

17:00-18:00  
October 30

<i>Surface Activated Bonding</i>	30P-01	Room-temperature wafer bonding of p-InP and n-GaAs with p-InGaAs / n-InGaAs interface Shuntaro Fujii, Chiba Institute of Technology	
	30P-02	Au flat micro-bump arrays fabricated by transfer and coining of Au thin films Shintaro Goto, Tohoku University	
	30P-03	Improving distribution of bump allocation for bonding load uniformity toward 3D integration of superconducting devices Mizuki Homma, Saitama University	
	30P-04	Room temperature bonding of SiO <sub>2</sub> wafers using ALD Al <sub>2</sub> O <sub>3</sub> ultrathin film Kenji Uno, Kyushu University	
	30P-05	Structural variation during annealing at diamond/silicon heterointerfaces fabricated by surface activated bonding Yutaka Ohno, Tohoku University	
	<i>Low-Temperature Bonding Fundamentals</i>	30P-06	Blade Test to Characterize Bonded Interface Fabricated using Atomic Diffusion Bonding with Amorphous Si and Al Films Hikaru Iemura, Tohoku University
		30P-07	Environmental moisture absorption by Oxide-coated Si wafers and effects on post-bonding void formation and bond quality Alessandro Stoppato, IMEC
		30P-08	Evaluating Room Temperature Bonding of SiCN-SiCN films with Different Compositions Yun-Hsuan Chen, National Yang Ming Chiao Tung University
		30P-09	Investigations on low temperature aluminium thermocompression bonding using surface passivation technique Kevin Diex, Fraunhofer ENAS
	<i>Power Device Applications</i>	30P-10	20-mm-square GaN/diamond bonding without vacuum process Takashi Matsumae, National Institute of Advanced Industrial Science and Technology (AIST)
		30P-11	Functional GaN Heterogeneous Integrated Substrate Based on Wafer Bonding and Smart-cut Technology Jiaxin Ding, National Key Laboratory of Materials for Integrated Circuits, Shanghai Institute of Microsystem and Information Technology, Chinese Academy of Sciences
		30P-12	Ohmic contact formation on N-polar n-GaN surfaces exposed by wafer bonding and back surface process Satoki Toka, Osaka Metropolitan University
		30P-13	Fabrication and Characterization of GaN HEMT with Nitride Buffer/Diamond Junctions Yosei Sunamoto, Osaka Metropolitan University
		30P-14	Withdrawn
		30P-15	Low Temperature Bonding of Diamond Heat Spreaders for Advanced Thermal Management Matthias Danner, EV Group

*Poster Session (II)*

14:50-15:50 October 31	<i>Surface Activated Bonding</i>	31P-01	100 GHz thin-film LNOI/Si optical modulator fabricated by room temperature wafer bonding Seigo Murakami, Kyushu University
		31P-02	Improvement of the effective thermal conductivity in DFC-PowerChip for highly intense laser gain media Yoichi Sato, RIKEN SPring-8 Center
		31P-03	Nb-In direct bonding at room temperature using surface activated bonding Shoei Ishiyama, Saitama University
		31P-04	Electrical characteristics of thick-metal-film interconnects on silicon oxide films by directly bonding Al foils Saki Murotani, Osaka Metropolitan University
		31P-05	Loading Pressure Effects on the Bonded Interface Structure in Atomic Diffusion Bonding Using Thick Au Films Kosuke Noguchi, Tohoku University
		31P-06	Effect of Ar-fast atom beam irradiation on n-Ga <sub>2</sub> O <sub>3</sub> /n-Si electrical conductance Takashi Matsumae, National Institute of Advanced Industrial Science and Technology (AIST)
	<i>Metal and Hybrid Bonding</i>	31P-07	Surface modification of Cu films by gas cluster ion beams using organic acid vapor for wafer bonding Noriaki Toyoda, University of Hyogo
		31P-08	Optimization of plating parameters for nanocrystalline copper for realizing low temperature Cu-Cu bonding Ankush Kumar, National Yang Ming Chiao Tung University
	<i>Hydrophilic Bonding and Fundamental</i>	31P-09	Hydroxide and fluoride catalyzed bonding interface closure for low temperature wafer bonding Paul Noel, CEA-Leti
		31P-10	Crystal orientation dependence of low-temperature bonding using germanium and diamond substrates Yuki Minowa, Tokyo University of Science
		31P-11	Low Temperature LiTaO <sub>3</sub> -to-Si Wafer Bonding Dominic Richter, Fraunhofer ENAS
		31P-12	Influence of Annealing-induced Edge Voids in Wafer-to-Wafer (W2W) Direct Bonding Sodai Ebiko, Yokohama National University
		31P-13	A systematic approach for tuning plasma-specific process results in plasma-activated low-temperature wafer-to-wafer bonding David Doppelbauer, EV Group
	<i>Power Device Applications</i>	31P-14	Heat dissipation characteristics of GaN on polycrystalline diamond HEMTs Chiharu Moriyama, Osaka Metropolitan University
		31P-15	Fabrication of GaN-on-Diamond HEMT Structures using PCD on a Back Plate for Low Cost and High Heat Dissipation Hazuki Tomiyama, Osaka Metropolitan University
		31P-16	SiC/Si heterojunction formed by direct wafer bonding and its characterization Chengguo Li, JFS Laboratory
	<i>New Process for 3D Integration</i>	31P-17	Patterning over the vertical sidewall for wiring front and backside electrodes on the device chip Yuki Ito, Toyota Technological Institute