2024 IEEE 74th Electronic Components and Technology Conference (ECTC 2024)

Denver, Colorado, USA
28-31 May 2024

Pages 1-580

IEEE Catalog Number: CFP24ECT-POD
ISBN: 979-8-3503-7599-2

IEEE Catalog Number: CFP24ECT-POD
ISBN (Print-On-Demand): 979-8-3503-7599-2
ISBN (Online): 979-8-3503-7598-5
ISSN: 0569-5503

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings.com

2024 IEEE 74th Electronic Components and Technology Conference (ECTC)

ECTC 2024

Table of Contents

Foreword from the Program Chair .... **lxxiv**
Welcome Message from the Conference Chairs .... **lxxv**
ECTC 2024 Executive Committee .... **lxxvii**
ECTC 2024 Program Committee .... **lxxix**

Session 1: Advances in Fan-Out, Wafer-Level, and Panel-Level Packaging Technologies Enabling New Applications

How to Manipulate Warpage in Fan-out Wafer and Panel Level Packaging 1
Tanja Braun (Fraunhofer Institute for Reliability and Microintegration, Germany), Ole Hölck (Fraunhofer Institute for Reliability and Microintegration, Germany), Marius Adler (Fraunhofer Institute for Reliability and Microintegration, Germany), Mattis Obst (Fraunhofer Institute for Reliability and Microintegration, Germany), Steve Voges (Fraunhofer Institute for Reliability and Microintegration, Germany), Karl-Friedrich Becker (Fraunhofer Institute for Reliability and Microintegration, Germany), Rolf Aschenbrenner (Fraunhofer Institute for Reliability and Microintegration, Germany), Marcus Voitel (Technical University, Germany), Marc Dreissigacker (Technical University, Germany), and Martin Schneider-Ramelow (Technical University, Germany)

Advanced FO-PLP With Multi-chip for Wearable Application 7
Jooyoung Choi (Samsung Electronics Co, Ltd, South Korea), Hyungmin Kim (Samsung Electronics Co, Ltd, South Korea), Eun Seok Cho (Samsung Electronics Co, Ltd, South Korea), Gyunghwan Oh (Samsung Electronics Co, Ltd, South Korea), Seungsoo Ha (Samsung Electronics Co, Ltd, South Korea), Jaehoon Choi (Samsung Electronics Co, Ltd, South Korea), Hwanpil Park (Samsung Electronics Co, Ltd, South Korea), Seok Won Lee (Samsung Electronics Co, Ltd, South Korea), and Dong Wook Kim (Samsung Electronics Co, Ltd, South Korea)

Transcending the Reticle Limit in On-Wafer Die Integration and Advanced Packaging: Full-Wafer Patterning with High-Productivity Electron Beam Lithography 11
Tsenguun Byambadorj (Multibeam Corporation), Andrew Ceballos (Multibeam Corporation), Kenneth MacWilliams (Multibeam Corporation), Ted Prescop (Multibeam Corporation), David Lam (Multibeam Corporation), Timothy Michalka (TLM Technologies), Craig Bishop (Deca Technologies Inc.), Cliff Sandstrom (Deca Technologies Inc.), and Tim Olson (Deca Technologies Inc.)

600mm x 600mm Fan-Out Panel Level Package (FOPLP) as an Alternative to Lead-Frame-Free Quad Flat No Lead (QFN) Package 16
Jacinta Aman Lim (Nepes Corporation, USA), Jane Lee (Nepes Corporation, USA), Hyun-Jin Shin (Nepes Corporation, S. Korea), YunMook Park (Nepes Corporation, S. Korea), Robin Davis (DECA, USA), YoungMo Lee (Nepes Corporation, S. Korea), and Brett Dunlap (nepes Corporation, AZ)

Challenges and Analysis for Pitch 25 μm -100 μm Mixed Micro Bumps And Interconnection in Fan-Out Embedded Bridge Die with TSV Package (FO-EB-TSV) 23
Kuei Hsiao Kuo (Siliconware Precision Industries Co., Ltd. (SPIL), Taiwan), Alan Li (Siliconware Precision Industries Co., Ltd. (SPIL), Taiwan), Sam Wu (Siliconware Precision Industries Co., Ltd. (SPIL), Taiwan), and Feng Lung Chien (Siliconware Precision Industries Co., Ltd. (SPIL), Taiwan)

High Precision and Productivity Bridge-Die-Last Bonding Process and Its Reliability for Pillar-Suspended Bridge (PSB) Architecture 29
Ichiro Kono (AOI Electronics, Japan), Yoshihiro Kometani (AOI Electronics, Japan), Atsushi Kuroha (AOI Electronics, Japan), and Yoichiro Kurita (Tokyo Institute of Technology, Japan)

Vertical Fan-Out(VFO) Package with Enhanced Form Factor and Performances for Mobile Applications 34
Ki-Jun Sung (SK hynix, Rebublic of Korea), Kyoungtae Eun (SK hynix, Rebublic of Korea), Jae-Min Kim (SK hynix, Rebublic of Korea), Se-Hyun Jang (SK hynix, Rebublic of Korea), Seowon Lee (SK hynix, Rebublic of Korea), Sungwon Yoon (SK hynix, Rebublic of Korea), Jongkwan Kim (SK hynix, Rebublic of Korea), Minsuk Kim (SK hynix, Rebublic of Korea), Jiyeong Yun (SK hynix, Rebublic of Korea), Jeongho Ju (SK hynix, Rebublic of Korea), Ho-Young Son (SK hynix, Rebublic of Korea), and Kang-Wook Lee (SK hynix, Rebublic of Korea)

Session 2: Advanced Die-to-Wafer Hybrid Bonding for Heterogeneous Integration

Direct Die-to-Wafer Hybrid Bonding Using Plasma Diced Dies and Bond Pad Pitch Scaling Down to 2 μm 40
Ye Lin (IMEC, Belgium), Pieter Bex (IMEC, Belgium), Koen Kennes (IMEC, Belgium), Jaber Derakhshandeh (IMEC, Belgium), Prathamesh Dhakras (IMEC, Belgium), Samuel Suhard (IMEC, Belgium), Carine Gerets (IMEC, Belgium), Sven Dewilde (IMEC, Belgium), Violeta Georgieva (IMEC, Belgium), Anne Jourdain (IMEC, Belgium), Gerald Beyer (IMEC, Belgium), and Eric Beyne (IMEC, Belgium)

Multi-functional Self-Assembled Monolayer for Chip-to-Chip and Chip-to-Wafer Hybrid Bonding 45
Murugesan Mariappan (Tohoku Univ., Japan), Kiyoharu Mori (T-Micro, Japan), Akifumi Kurachi (JX Metals, Japan), Toru Imori (JX Metals, japan), Toshiya Kojima (Hokkaido Univ., Japan), Wakako Nakano (Hokkaido Univ., Japan), Hiroyuki Hashimoto (Tohoku Univ., Japan), and Takafumi Fukushima (Tohoku Univ., Japan)

3D Heterogeneous Integration with Sub-3μm Bond Pitch Chip-to-Wafer Hybrid Bonding 51
Yi Shi (Intel Corporation, USA), Haris Khan Niazi (Intel Corporation, USA), Michael A. Rosshirt (Intel Corporation, USA), Saritha Kumari Paletti (Intel Corporation, USA), and Xavier F. Brun (Intel Corporation, USA)

Novel Three-Layer Stacking Process with Face-to-Back CoW 6 μm-pitch Hybrid Bonding 56
Akihiro Urata (Sony Semiconductor Solutions Corporation, Japan), Takahiro Kamei (Sony Semiconductor Solutions Corporation, Japan), Akihisa Sakamoto (Sony Semiconductor Solutions Corporation, Japan), Hirotaka Yoshioka (Sony Semiconductor Solutions Corporation, Japan), Takaaki Hirano (Sony Semiconductor Solutions Corporation, Japan), Kan Shimizu (Sony Semiconductor Solutions Corporation, Japan), Yoshihisa Kagawa (Sony Semiconductor Solutions Corporation, Japan), and Hayato Iwamoto (Sony Semiconductor Solutions Corporation, Japan)

Dielectric Stack Optimization for Die-Level Warpage Reduction for Chip-to-Wafer Hybrid Bonding 62
B.S.S Chandra Rao (Institute of Microelectronics, Republic of Singapore), Dileep Kumar Mishra (Institute of Microelectronics, Republic of Singapore), Nagendra Sekhar Vasarla (Institute of Microelectronics, Republic of Singapore), Ismael Cereno Daniel (Institute of Microelectronics, Republic of Singapore), Sasi Kumar Tippabhotla (Institute of Microelectronics, Republic of Singapore), Ser Choong Chong (Institute of Microelectronics, Republic of Singapore), Hemanth Kumar C (Institute of Microelectronics, Republic of Singapore), and Srinivasa Rao Vempati (Institute of Microelectronics, Republic of Singapore)

Low Temperature Wafer Level Hybrid Bonding Enabled by Advanced SiCN and Surface Activation. 69
Fumihiro Inoue (YOKOHAMA National University, Japan), Atsushi Nagata (Tokyo Electron Kyushu Limited, Japan), Junya Fuse (YOKOHAMA National University, Japan), Sodai Ebiko (YOKOHAMA National University, Japan), Ryosuke Sato (YOKOHAMA National University, Japan), Kenichi Saito (Tokyo Electron Limited, Japan), Yoshihiro Kondo (Tokyo Electron Kyushu Limited, Japan), Takuo Kawauchi (Tokyo Electron Limited, Japan), Junghwan Park (SK hynix Inc, Korea), Chiwoo Ahn (SK hynix Inc, Korea), Myeonghyeon Kim (SK hynix Inc, Korea), and Jiho Kang (SK hynix Inc, Korea)

A Study on D2W Hybrid Cu Bonding Technology for HBM Multi-die Stacking 76
Hyeonmin Lee (Samsung Electronics Co., Ltd, South Korea), Jihoon Kim (Samsung Electronics Co., Ltd, South Korea), Min-Ki Kim (Samsung Electronics Co., Ltd, South Korea), Wonil Lee (Samsung Electronics Co., Ltd, South Korea), Aeni Jang (Samsung Electronics Co., Ltd, South Korea), Hyuekjae Lee (Samsung Electronics Co., Ltd, South Korea), and Dae-Woo Kim (Samsung Electronics Co., Ltd, South Korea)

Session 3: Co-Packaged Optics

High Density Integration of Silicon Photonic Chiplets for 51.2T Co-Packaged Optics 81
Sukeshwar Kannan (Broadcom, USA), Ray Chang (Broadcom, Taiwan (R.O.C)), Hari Potluri (Broadcom, USA), Sheng Zhang (Broadcom, USA), Jay Li (Siliconware Precision Industries Ltd, Taiwan (R.O.C)), Bruce Xu (Siliconware Precision Industries Ltd, Taiwan (R.O.C)), and Hsi-Chang Hsu (Siliconware Precision Industries Ltd, Taiwan (R.O.C))

Ultra Low-Loss Ion-Exchange Waveguides in Optimized Alkali Glass for Co-Packaged Optics 85
Lars Brusberg (Corning Research & Development Corporation, USA), Matthew J. Dejneka (Corning Research & Development Corporation, USA), Chukwudi A. Okoro (Corning Research & Development Corporation, USA), David J. McEnroe (Corning Research & Development Corporation, USA), Aramais R. Zakharian (Corning Research & Development Corporation, USA), and Chad C. Terwilliger (Corning Research & Development Corporation, USA)

A Surface-Mount Photonic Package with a Photonic-Wire-Bonded Glass Interposer as a Hybrid Integration Platform for co-Packaged Optics 90
Hiroshi Uemura (Sumitomo Electric Industries, Ltd., Japan), Taichi Misawa (Sumitomo Electric Industries, Ltd., Japan), Yasutaka Mizuno (Sumitomo Electric Industries, Ltd., Japan), Naoki Itabashi (Sumitomo Electric Industries, Ltd., Japan), Hajime Arao (Sumitomo Electric Industries, Ltd., Japan), Tetsuya Nakanishi (Sumitomo Electric Industries, Ltd., Japan), Keiji Tanaka (Sumitomo Electric Industries, Ltd., Japan), Tomomi Sano (Sumitomo Electric Industries, Ltd., Japan), Katsumi Uesaka (Sumitomo Electric Industries, Ltd., Japan), Mami Miyairi (FICT LIMITED, Japan), Yoshikatsu Ishizuki (FICT LIMITED, Japan), Taiji Sakai (FICT LIMITED, Japan), and Yoichiro Kurita (Tokyo Institute of Technology, Japan)

Development of all-Photonics-Function Embedded Package Substrate Using 2.3D RDL Interposer for Co-Packaged Optics 96
Akihiro Noriki (National Institute of Advanced Industrial Science and Technology (AIST), Japan), Hirotaka Uemura (Kyocera Corporation, Japan), Haruhiko Kuwatsuka (National Institute of Advanced Industrial Science and Technology (AIST), Japan), Naoki Matsui (Kyocera Corporation, Japan), Reona Motoji (Kyocera Corporation, Japan), Dan Maeda (Kyocera Corporation, Japan), Tomoya Sugita (Kyocera Corporation, Japan), Fumi Nakamura (National Institute of Advanced Industrial Science and Technology (AIST), Japan), Satoshi Suda (National Institute of Advanced Industrial Science and Technology (AIST), Japan), Takayuki Kurosu (National Institute of Advanced Industrial Science and Technology (AIST), Japan), and Takeru Amano (National Institute of Advanced Industrial Science and Technology (AIST), Japan)

Advanced 3D Packaging of 3.2Tbs Optical Engine for Co-Packaged Optics (CPO) in Hyperscale Data Center Networks 101
Aparna Prasad (Cisco Systems, USA), Cristiana Muzio (Cisco Systems, USA), Paul Ton (Cisco Systems, USA), and Sandeep Razdaan (Cisco Systems, USA)

3D-Printed Beam Expanding Lens for Chip to Fiber Vertical Coupling 107
Yasutaka Mizuno (Sumitomo Electric Industries, Ltd., Japan), Hiroshi Uemura (Sumitomo Electric Industries, Ltd., Japan), Tomoya Saeki (Sumitomo Electric Industries, Ltd., Japan), Keiji Tanaka (Sumitomo Electric Industries, Ltd., Japan), and Katsumi Uesaka (Sumitomo Electric Industries, Ltd., Japan)

Characterization of QSFP and OSFP CPO ELS Modules Employing an 8-Channel CWDM TOSA in Practical air-Cooling Conditions 112
Kohei Umeta (Furukawa Electric Co., Ltd., Japan), Taketsugu Sawamura (Furukawa Electric Co., Ltd., Japan), Yuki Shiroishi (Furukawa Electric Co., Ltd., Japan), and Hideyuki Nasu (Furukawa Electric Co., Ltd., Japan)

Session 4: Reliability of Advanced Substrates and Interconnects

Reliability Assessment of Stacked-Vias with Different Configurations through a Unit Cell-based Substrate Design 118
Krishna Tunga (IBM Corporation, USA), Joseph Ross (IBM Corporation, USA), Sushumna Iruvanti (IBM Corporation, USA), Bakul Parikh (IBM Corporation, USA), and Shidong Li (IBM Corporation, USA)

Enhanced Biased HAST Reliability of Polyimide for High-Density Redistribution Layers 126
Takumi Onuma (HD MicroSystems, Ltd. , Japan), Daisaku Matsukawa (HD MicroSystems, Ltd. , Japan), and Takahiro Tanabe (HD MicroSystems, Ltd. , Japan)

Effect of Lamination Process-Induced Residual stress on the CTE of Advanced Prepregs Before and After Solder Reflow Process 131
Byoung-Phil Kang (Chungbuk National University, Korea), Jong-Yun Lee (Chungbuk National University, Korea), Jaesung Kim (Simmtech, Korea), Jongwoo Park (Simmtech, Korea), Kyu-Jin Lee (Doosan Corporation, Korea), Yongrae Jang (University of Maryland, USA), and Bongtae Han (University of Maryland, USA)

Fan-out PoP Solder Joint Reliability Investigation by System Power Cycling 137
C.K. Yu (Mediatek Inc. Hsinchu, Taiwan), Techi Wong (Mediatek Inc. Hsinchu, Taiwan), Hank Hsieh (Mediatek Inc. Hsinchu, Taiwan), and P. H. Tsao (Mediatek Inc. Hsinchu, Taiwan)

Fatigue-Fracture Propensity Measurement and Competing Risk Model for FCBGA Interfaces under Sustained Humidity and Temperature Exposure 142
Pradeep Lall (Auburn University), Aathi Raja Ram Pandurangan (Auburn University), Padmanava Choudhury (Auburn University), Madhu Kasturi (Auburn University), and Jeff Suhling (Auburn University)

Evaluation of Vapor Pressure Induced Debonding Failure in Fan-Out Package under Reflow Condition 150
Bo-Shuo Chen (National Cheng Kung University, Taiwan, ROC), Tz-Cheng Chiu (National Cheng Kung University, Taiwan, ROC), Wei-Jie Yin (ASE Group Kaohsiung, Taiwan, ROC), Chin-Li Kao (ASE Group Kaohsiung, Taiwan, ROC), and Chih-Pin Hung (ASE Group Kaohsiung, Taiwan, ROC)

Characterization of a Piezoresistive Sensor for In-situ Health Monitoring of Solder Bumps 157
Adwait Inamdar (Delft University of Technology), Varun Thukral (NXP Semiconductors, Netherlands), Letian Zhang (NXP Semiconductors, Netherlands), Jeroen J. M. Zaal (NXP Semiconductors, Netherlands), Michiel van Soestbergen (NXP Semiconductors, Netherlands), Hans Tuinhout (NXP Semiconductors, Netherlands), Willem D. van Driel (Delft University of Technology, Netherlands), and GuoQi Zhang (Delft University of Technology, Netherlands)

Session 5: Digital Healthcare: Wearable Sensors, and Flexible Electronics

Integration of a Flexible Thin-Film Lithium-Ion Battery with a Wireless Charging System and a Flexible Micro-LED Array 164
Guangqi Ouyang (Center for Heterogeneous Integration and Performance Scaling (UCLA CHIPS), USA), Mansi Sheth (UCLA Center for Heterogeneous Integration and Performance Scaling (UCLA CHIPS), USA), Henry Sun (UCLA Center for Heterogeneous Integration and Performance Scaling (UCLA CHIPS), USA), and Subramanian S. Iyer (UCLA Center for Heterogeneous Integration and Performance Scaling (UCLA CHIPS), USA)

Ferrite-Based NFC Antenna and Sensor Package Module Development for Implantable Continuous Glucose Monitor 171
Gaurav Mehrotra (Renesas Electronics America Inc., USA), Young Kim (Renesas Electronics America Inc., USA), Marko Mailand (Renesas Electronics America Inc., USA), James Masciotti (Senseonics Inc., USA), Ginger Huang (ASE Chung-Li, Taiwan), Jackson Chen (ASE Chung-Li, Taiwan), and Ryan Lai (ASE Chung-Li, Taiwan)

Evaluation of Materials for the Design and Development of Sustainable Low-Cost Single-Use Electrode Leads for Wearable Medical Devices 179
Babatunde Falola (Binghamton University, USA), Riadh Al-Haidari (Binghamton University, USA), Olya Noruz Shamsian (Binghamton University, USA), Udara Somarathna (Binghamton University, USA), Bryan Cabrera (Binghamton University, USA), Cameron Cretaro (Binghamton University, USA), Mohammed Alhendi (Binghamton University, USA), Mark Poliks (Binghamton University, USA), Gurvinder Singh Khinda (GE HealthCare, USA), Nancy Stoffel (GE Research), Tzu-Jen Kao (GE HealthCare, USA), and Rafael Tudela (Tapecon Inc, USA)

Conformal Skin Patch for Dehydration Monitoring in Dementia Patient 187
Musafargani Sikkandhar (Institute of Microelectronics, Singapore), Ramona B. Damalerio (Institute of Microelectronics, Singapore), Wei Da Toh (Institute of Microelectronics, Singapore), and Ming-Yuan Cheng (Institute of Microelectronics, Singapore)

Silicon-Based Membrane Pressure Sensor for Inline Monitoring of Pressure and Hermeticity of Small-Volume Bonded Packages 193
Jannik Koch (Insitute of Micro Production Technology, Leibniz University Hannover, Germany), Levin Marten Brinkmann (Insitute of Micro Production Technology, Leibniz University Hannover, Germany), Alexander Kassner (Insitute of Micro Production Technology, Leibniz University Hannover, Germany), Folke Dencker (Insitute of Micro Production Technology, Leibniz University Hannover, Germany), and Marc Christopher Wurz (Insitute of Micro Production Technology, Leibniz University Hannover, Germany)

Using Flexible Hybrid Electronics on a Miniaturized Non-Invasive Bio-Optical Sensor for Hemoglobin Detection 201
Yu-Chil Lee (Advanced Semiconductor Engineering. Inc., Taiwan), Kai-Lun Yu (Advanced Semiconductor Engineering. Inc., Taiwan), Shu-An Tsai (Advanced Semiconductor Engineering. Inc., Taiwan), Pai-Sheng Shih (Advanced Semiconductor Engineering. Inc., Taiwan), Guo-Sin Huang (Advanced Semiconductor Engineering. Inc., Taiwan), Tien-Chia Liu (Advanced Semiconductor Engineering. Inc., Taiwan), Tzyy-Wei Fu (National Cheng-Kung University, Taiwan), Sheng-Hao Tseng (National Cheng-Kung University, Taiwan), Hung-I Lin (Advanced Semiconductor Engineering. Inc., Taiwan), Jen-Chun Chen (Advanced Semiconductor Engineering. Inc., Taiwan), Jen-Kuang Fang (Advanced Semiconductor Engineering. Inc., Taiwan), and Harrison Chang (Advanced Semiconductor Engineering. Inc., Taiwan)

A Multi-channel, Embedded, and Geometrically Optimized Filter Bank Utilizing Advanced Packaging Topologies for Miniaturized RF Modules in IoT and Wearable Systems 208
Hani Al Jamal (Georgia Institute of Technology, USA), Marvin Joshi (Georgia Institute of Technology, USA), Manos M. Tentzeris (Georgia Institute of Technology, USA), and Nickolas Kingsley (Teradyne, Inc., USA)

Session 6: Thermal-Mechanical Reliability Simulations

Modeling and Optimization of Thermal Cycling Performance to Reduce Ratcheting-Induced Passivation Cracking in High-Voltage Power Modules 215
Liangbiao Chen (onsemi, USA) and Yong Liu (onsemi, USA)

Interfacial Reliability and Predictive Models for Potted Board Assemblies in Inclined 25000g Mechanical Shock 221
Pradeep Lall (Auburn University), Aathi Raja Ram Pandurangan (Auburn University), Padmanava Choudhury (Auburn University), Jeff Suhling (Auburn University), and Ken Blecker (US Army CCDC-AC)

A Novel Approach to Assess Board Level Solder Joint Reliability for Flip-Chip on Leadframe Package Using Finite Element Analysis 229
Guangxu Li (Texas Instruments, USA), Siva Gurrum (Texas Instruments, USA), Frank Mortan (Texas Instruments, USA), Li Jiang (Texas Instruments, USA), and Carlos Arroyo (Texas Instruments, USA)

A Robust Mesh Size Control Technology Suitable for Various Empirical Equations for Predicting Solder Joint Reliability 234
Kuo-Ning Chiang (National Tsing Hua University Hsin Chu, Taiwan), C. E. Lee (National Tsing Hua University Hsin Chu, Taiwan), and Cadmus Yuan (Feng Chia University Taichung, Taiwan)

Multi-material Corner Singularity in Electronic Packaging: Avoiding Mesh Dependence in Analyzing Stress 240
Yaxiong Chen (NXP Semiconductors, USA), Torsten Hauck (NXP Semiconductors, Germany), and Ganesh Subbarayan (Purdue University, USA)

Bayesian Optimization of Large Glass Package Architecture for System-Level Reliability in High-Performance Computing Applications 246
Emanuel Torres Surillo (Woodruff School of Mechanical Engineering Georgia Tech, USA), Ramón A. Sosa (Woodruff School of Mechanical Engineering, Georgia Tech, USA), Christian Molina (Woodruff School of Mechanical Engineering, Georgia Tech, USA), Hyunggyu Park (3D Systems Packaging Research Center Georgia Tech, USA), Pratik Nimbalkar (3D Systems Packaging Research Center, Georgia Tech, USA), Sriram Srirangan (Georgia Tech, USA), Lila D. Dahal (Institute for Electronics and Nanotechnology, Georgia Tech, USA), Yongwon Lee (Woodruff School of Mechanical Engineering, Georgia Tech, USA), and Vanessa Smet (Woodruff School of Mechanical Engineering, Georgia Tech, USA)

Prediction of Moisture Absorption Characteristics Under Normal/Accelerated Preconditioning Condition in Multi Chip Packages 254
Hyunggyun Noh (Samsung Electronics, South Korea), Jinsoo Bae (Samsung Electronics, South Korea), Keunho Rhew (Samsung Electronics, South Korea), Soojin Yoo (Samsung Electronics, South Korea), Jiyoung Lim (Samsung Electronics, South Korea), Yuchul Hwang (Samsung Electronics, South Korea), and Sangwoo Pae (Samsung Electronics, South Korea)

Session 7: Heterogeneous Integration: Systems Design, Signal & Power Delivery, and Process Optimization

Next Generation Large Size High Interconnect Density CoWoS-R Package 259
Chien-Hsun Lee (Taiwan Semiconductor Manufacturing Company, Taiwan), Yh Hu (Taiwan Semiconductor Manufacturing Company, Taiwan), Sm Chen (Taiwan Semiconductor Manufacturing Company, Taiwan), Cl Lai (Taiwan Semiconductor Manufacturing Company, Taiwan), M Liu (Taiwan Semiconductor Manufacturing Company, Taiwan), Hy Chen (Taiwan Semiconductor Manufacturing Company, Taiwan), J Lin (Taiwan Semiconductor Manufacturing Company, Taiwan), Mc Yew (Taiwan Semiconductor Manufacturing Company, Taiwan), Ck Hsu (Taiwan Semiconductor Manufacturing Company, Taiwan), My Chiu (Taiwan Semiconductor Manufacturing Company, Taiwan), Ch Chen (Taiwan Semiconductor Manufacturing Company, Taiwan), Mw Chou (Taiwan Semiconductor Manufacturing Company, Taiwan), Wc Chen (Taiwan Semiconductor Manufacturing Company, Taiwan), J Chang (Taiwan Semiconductor Manufacturing Company, Taiwan), C.C. Hsieh (Taiwan Semiconductor Manufacturing Company, Taiwan), Cs Chen (Taiwan Semiconductor Manufacturing Company, Taiwan), Hw Chen (Taiwan Semiconductor Manufacturing Company, Taiwan), Ct Wang (Taiwan Semiconductor Manufacturing Company, Taiwan), Kathy Yan (Taiwan Semiconductor Manufacturing Company, Taiwan), Shin-Puu Jeng (Taiwan Semiconductor Manufacturing Company, Taiwan), and Jun He (Taiwan Semiconductor Manufacturing Company, Taiwan)

World's First UCIe Interoperability Silicon Enabling Open Standards Heterogeneous Integration 264
Xavier Brun (Intel Corporation, USA), Stephen Wong (Intel Corporation, Canada), Manuel Mota (Intel Corporation, Portugal), and Edidiong Udofia (Intel Corporation, USA)

Scalable Advanced DBHi Chiplet Package Using Silicon Bridge with 30 μm-Pitch Solder Joints... 269
Akihiro Horibe (IBM Research - Tokyo, Japan), Takahito Watanabe (IBM Research - Tokyo, Japan), Chinami Marushima (IBM Research - Tokyo, Japan), Sayuri Kohara (IBM Research - Tokyo, Japan), Yasuharu Yamada (IBM Research - Tokyo, Japan), Hiroyuki Mori (IBM Research - Tokyo, Japan), Divya Taneja (IBM Infrastructure, Canada), Katherine Pilger (IBM Infrastructure, Canada), Alexis Jacques-Fortin (IBM Infrastructure, Canada), Maxime Godard (IBM Infrastructure, Canada), Qianwen Chen (IBM Research – Yorktown Heights, USA), Eric Perfecto (IBM Research – Albany, USA), Aakrati Jain (IBM Research – Albany, USA), Joseph Ross (IBM Research – Albany, USA), Thomas Wassick (IBM Infrastructure, USA), and Isabel de Sousa (IBM Infrastructure, Canada)

Performance Evaluation of UCIe-Based Die-to-Die Interface on Low-Cost 2D Packaging Technology 274
Srujan Penta (Georgia Institute of Technology, USA; Marvell Technology, Inc., USA), Ting Zheng (Marvell Technology, Inc., USA), Eric Tremble (Marvell Technology, Inc., USA), Aatreya Chakravarti (Marvell Technology, Inc., USA), Anthony Sigler (Marvell Technology, Inc., USA), Zhonghao Zhang (Georgia Institute of Technology, USA), Carl Benes (Marvell Technology, Inc., USA), Muhannad S Bakir (Georgia Institute of Technology, USA), and Wolfgang Sauter (Marvell Technology, Inc., USA)

Signal & Power Integrity Optimization Utilizing Silicon Core Substrate 279
Seann Ayers (Applied Materials Inc., USA), Steven Verhaverbeke (Applied Materials Inc., USA), Han-Wen Chen (Applied Materials Inc., USA), Liu Jiang (Applied Materials Inc., USA), and El Mehdi Bazizi (Applied Materials Inc., USA)

Package Power Delivery Architecture for High Performance Computing Systems with a 1 kW IVR Operated in CCM-DCM Boundary Mode Condition 285
Ramin Rahimzadeh Khorasani (Pennsylvania State University, USA), Xingchen Li (Georgia Institute of Technology, USA), Joon Woo Kim (Georgia Institute of Technology, USA), Prahalad Murali (Georgia Institute of Technology, USA), Rohit Sharma (Indian Institute of Technology Ropar, India), and Madhavan Swaminathan (Pennsylvania State University, USA)

Study for Realization of the Next Generation High Density RDL Packaging for 2.5D Large Silicon Interposer 293
Masaki Mizutani (Canon inc., JAPAN), Douglas Shelton (Canon U.S.A, USA), Yusuke Tokuyama (Canon inc., JAPAN), Noriyuki Shiozawa (Canon inc., JAPAN), Mizuma Murakami (Canon inc., JAPAN), Hiromi Suda (Canon inc., JAPAN), Ken-Ichiro Shinoda (Canon inc., JAPAN), and Ken-Ichiro Mori (Canon inc., JAPAN)

Session 8: Sub-Micron Scaling in Wafer-to-Wafer Hybrid Bonding

Study of Ultra-Fine 0.4 µm Pitch Wafer-to-Wafer Hybrid Bonding and Impact of Bonding Misalignment 299
Yukako Ikegami (Sony Semiconductor Solutions Corporation, Japan), Takumi Onodera (Sony Semiconductor Solutions Corporation, Japan), Masanori Chiyozono (Sony Semiconductor Solutions Corporation, Japan), Akihisa Sakamoto (Sony Semiconductor Solutions Corporation, Japan), Kan Shimizu (Sony Semiconductor Solutions Corporation, Japan), Yoshihisa Kagawa (Sony Semiconductor Solutions Corporation, Japan), and Hayato Iwamoto (Sony Semiconductor Solutions Corporation, Japan)

3-Layer Fine Pitch Cu-Cu Hybrid Bonding Demonstrator With High Density TSV For Advanced CMOS Image Sensor Applications 305
StéPhane Nicolas (Univ. Grenoble Alpes, France), Jerzy-Javier Suarez-Berru (Univ. Grenoble Alpes, France), Nicolas Bresson (Univ. Grenoble Alpes, France), Carole Socquet-Clerc (Univ. Grenoble Alpes, France), Myriam Assous (Univ. Grenoble Alpes, France), Stephan Borel (Univ. Grenoble Alpes, France), RéMi VéLard (Univ. Grenoble Alpes, France), Jérôme Dechamp (Univ. Grenoble Alpes, France), Renan Bouis (Univ. Grenoble Alpes, France), Antonio Roman (Univ. Grenoble Alpes, France), Karine Abadie (Univ. Grenoble Alpes, France), and Damien Hebras (Univ. Grenoble Alpes, France)

Scaling Cu/SiCN Wafer-to-Wafer Hybrid Bonding Down to 400nm Interconnect Pitch 312
Boyao Zhang (imec, Belgium), Soon-Aik Chew (imec, Belgium), Michele Stucchi (imec, Belgium), Sven Dewilde (imec, Belgium), Serena Iacovo (imec, Belgium), Liesbeth Witters (imec, Belgium), Tomas Webers (imec, Belgium), Koen Van Sever (imec, Belgium), Joeri De Vos (imec, Belgium), Andy Miller (imec, Belgium), Gerald Beyer (imec, Belgium), and Eric Beyne (imec, Belgium)

Fine Pitch and Low Temperature Nanocrystalline-Nanotwinned Cu and SiCN-to-SiO2 Wafer-to-Wafer Hybrid Bonding 319
Wei-Lan Chiu (Industrial Technology Research Institute (ITRI), Taiwan), Ou-Hsiang Lee (Industrial Technology Research Institute (ITRI), Taiwan), Hsiang-Hung Chang (Industrial Technology Research Institute (ITRI), Taiwan), James Yi-Jen Lo (Nanya Technology Corp. (NTC), Taiwan), Chiang-Lin Shih (Nanya Technology Corp. (NTC), Taiwan), Hsih-Yang Chiu (Nanya Technology Corp. (NTC), Taiwan), Chin-Hung Wang (Industrial Technology Research Institute (ITRI), Taiwan), and Wei-Chung Lo (Industrial Technology Research Institute (ITRI), Taiwan)

Single-Grain Cu μ-Joint Formation Induced by Selective Under-Seed-Metallurgy for Hybrid Bonding 325
Murugesan Mariappan (Tohoku University, Japan), Kiyoharu Mori (T-Micro, Japan), Masahiro Sawa (JCU Corporation, Japan), Jinta Nampo (JCU Corporation, Japan), Hiroyuki Hashimoto (Tohoku University, Japan), and Takafumi Fukushima (Tohoku University, Japan)

0.5 μm Pitch Wafer-to-Wafer Hybrid Bonding at Low Temperatures with SiCN Bond Layer 331
Kai Ma (Applied Materials, Inc., USA), Nikolaos Bekiaris (Applied Materials, Inc., USA), Ching-Hsiang Hsu (Applied Materials, Inc., USA), Lei Xue (Applied Materials, Inc., USA), Sesh Ramaswami (Applied Materials, Inc., USA), Taotao Ding (EV Group, Austria), Gernot Probst (EV Group, Austria), Tobias Wernicke (EV Group, Austria), Thomas Uhrmann (EV Group, Austria), and Markus Wimplinger (EV Group, Austria)

Development of Double Cantilever Beam Technique for Wafer-to-Wafer Bond Energy Measurement........ 337
Guohua Wei (Micron Technology, USA), Matthew Gerber (Micron Technology, USA), Derik Rudd (Micron Technology, USA), Robert Sibley (Micron Technology, USA), Pengfei Nie (Micron Technology, USA), Logan Battrell (Micron Technology, USA), Andrew Bayless (Micron Technology, USA), Sam Ireland (Micron Technology, USA), Mark Fischer (Micron Technology, USA), Harsh Jain (Micron Technology, USA), Kinsey Canova (Micron Technology, USA), Dan Markowitz (Micron Technology, USA), and David Palsulich (Micron Technology, USA)

Session 9: Advanced Processes for Chip Stacking

IR Laser Release for 3D Stacked Devices: Effect of the Release Stack Structure on the Debonding Mechanism 343
François Chancerel (IMEC, Belgium), Peter Urban (EV Group, Austria), John Slabbekoorn (imec, Belgium), Simon Halas (EV Group, Austria), Julian Bravin (EV Group, Austria), Steven Brems (imec, Belgium), Thomas Uhrmann (EV Group, Austria), Markus Wimplinger (EV Group, Austria), Alain Phommahaxay (imec, Belgium), and Eric Beyne (imec, Belgium)

High Performance 3D Package Technology for Mobile Application Processor (AP) 348
Sun Jae Kim (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Cheol Kim (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Huiyeong Jang (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Jongpa Hong (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Seongyo Kim (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Yongwon Choi (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Chajea Jo (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Sun-Kyung Seo (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), Dong Kwan Kim (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea), and Dae-Woo Kim (Advanced Package Business Team, Samsung Electronics Co., Ltd., Korea)

Room Temperature Bonding of CVD Polycrystalline Diamond Wafers to Semiconductor and Piezo-Electric Single Crystalline Wafers 353
Tadatomo Suga (Meisei University, Japan), Junsha Wang (Meisei University, Japan), Kazuya Yamamura (Osaka University, Japan), and Izumi Kataoka (IIPT Co., Ltd, Japan)

Bump-Less Interconnect with Room Temperature Pre-Bondable Adhesive and Solder for High Throughput Chip Stacking 357
Wataru Okada (Mitsui Chemicals, Inc., Japan), Yuzo Nakamura (Mitsui Chemicals, Inc., Japan), Yasuhisa Kayaba (Mitsui Chemicals, Inc., Japan), Takuo Shikama (Mitsui Chemicals, Inc., Japan), Yutaka Hisamune (Mitsui Chemicals, Inc., Japan), Kahori Tamura (Mitsui Chemicals, Inc., Japan), Satoshi Inada (Mitsui Chemicals, Inc., Japan), and Rikia Furusho (Mitsui Chemicals, Inc., Japan)

IR Laser Debond from Silicon Carrier Wafers with Inorganic Thin Film Release Layers for High-Density 2.5D and 3D Integration 363
Thomas Sounart (Intel Corp., USA), Tushar Talukdar (Intel Corp., USA), Henning Braunisch (Intel Corp., USA), Aleksandar Aleksov (Intel Corp., USA), Kimin Jun (Intel Corp., USA), Adel Elsherbini (Intel Corp., USA), Paul Nordeen (Intel Corp., USA), Brandon Rawlings (Intel Corp., USA), Veronica Strong (Intel Corp., USA), Shawna Liff (Intel Corp., USA), and Johanna Swan (Intel Corp., USA)

Backside Thinning Process Development for High-Density TSV in a 3-Layer Integration 370
Renan Bouis (Univ. Grenoble Alpes, CEA Leti, France), Jérémy Marchand (Univ. Grenoble Alpes, CEA Leti, France), Agathe Andre (Univ. Grenoble Alpes, CEA Leti, France), Stephan Borel (Univ. Grenoble Alpes, CEA Leti, France), Jérôme Dechamp (Univ. Grenoble Alpes, CEA Leti, France), Lionel Vignoud (Univ. Grenoble Alpes, CEA Leti, France), Paul Valentin (Univ. Grenoble Alpes, CEA Leti, France), Myriam Assous (Univ. Grenoble Alpes, CEA, Leti, France), and Damien Hebras (Univ. Grenoble Alpes, CEA, Leti, France)

Process Development and Characterization of Ru-Based UBM for In Bumps Integration for Quantum Computing Applications 378
Harold Le Tulzo (Technic France, France), Diane Bijou (Technic France, France), Thérèse Souza (Technic Inc., USA), Anthony Gallegos (Technic Inc., USA), Candice Thomas (Univ. Grenoble Alpes, CEA, LETI, France), Edouard Deschaseaux (Univ. Grenoble Alpes, CEA, LETI, France), Céline Feautrier (Univ. Grenoble Alpes, CEA, LETI, France), Jean Charbonnier (Univ. Grenoble Alpes, CEA, LETI, France), Alain Gueugnot (Univ. Grenoble Alpes, CEA, LETI, France), Jaber Derakhshandeh (Imec, Belgium), Tassawar Hussain (Imec, Belgium), and Jérôme Daviot (Technic France, France)

Session 10: Novel 3D Integration and Hybrid Bonding Solutions

Investigation of Distortion in Wafer-to-wafer Bonding with Highly Bowed Wafers 386
Shuo Kang (IMEC, Belgium), Serena Iacovo Iacovo (IMEC, Belgium), Koen D'havé (IMEC, Belgium), Stefaan Van Huylenbroeck (IMEC, Belgium), Oguzhan Orkut Okudur (IMEC, Belgium), Anton Alexeev (EVG, Austria), Thomas Plach (EVG, Austria), Gernot Probst (EVG, Austria), Taotao Ding (EVG, Austria), Markus Wimplinger (EVG, Austria), Thomas Uhrmann (EVG, Austria), Joeri De Vos (IMEC, Belgium), Gerald Beyer (IMEC, Belgium), and Eric Beyne (IMEC, Belgium)

Development of 0.5 µm Pixel 3-Wafers Stacked CMOS Image Sensor With Through Silicon Deep Contact and In-Pixel Cu-Cu Bonding Process 394
Doyeon Kim (Samsung Electronics, Republic of Korea)

Non-TCB Process Cu/SiO2 Hybrid Bonding Using Plasma-free Hydrophilicity Enhancement with NaOH for Chip-to-Wafer Bonding 399
Yu-An Chen (National Yang Ming Chiao Tung University (NYCU), Taiwan), Jia-Juen Ong (National Yang Ming Chiao Tung University (NYCU), Taiwan), Wei-Lan Chiu (Industrial Technology Research Institute (ITRI), Taiwan), Wei-You Hsu (National Yang Ming Chiao Tung University (NYCU), Taiwan), Shih-Chi Yang (National Yang Ming Chiao Tung University (NYCU), Taiwan), Hsiang-Hung Chang (Industrial Technology Research Institute (ITRI), Taiwan), and Chih Chen (National Yang Ming Chiao Tung University (NYCU), Taiwan)

Novel Low Thermal Budget Bonding Using Single Wafer Thermal Processing System, Resulting in Excellent Wafer-to-Wafer Hybrid Bonding at sub-0.5um Pitch 404
Mariia Gorchichko (Applied Materials, USA), Shashank Sharma (Applied Materials, USA), Ben Ng (Applied Materials, USA), Tyler Sherwood (Applied Materials, USA), Yoocharn Jeon (Applied Materials, USA), Dylan Mcintyre (Applied Materials, USA), Kun Li (Applied Materials, USA), Sarabjot Singh (Applied Materials, USA), Evan Iler (Applied Materials, USA), David Knapp (Applied Materials, USA), Amit Prakash (Applied Materials, USA), Viet Nguen (Applied Materials, USA), Raghav Sreenivasan (Applied Materials, USA), Siddarth Krishnan (Applied Materials, USA), and Michael Chudzik (Applied Materials, USA)

Moving Towards Microchannel-Based Chip Cooling 408
Paul Semenza (SEMI, USA), Dave Thomas (KLA, UK), Garrett Oakes (EV Group, USA), Dave Kirsch (EV Group, USA), Yin Hang (Meta, USA), Kuo-Chung Yee (TSMC, Taiwan), Michael Cumbie (HP Inc., USA), Paul Benning (HP Inc., USA), Madhusudan Iyengar (Google, USA), Lihong Cao (ASE, USA), William Chen (ASE, USA), and Gity Samadi (SEMI, USA)

Novel Inorganic IR Release Process for High Temperature W2W and D2W Integration 415
Peter Urban (EV Group), Boris Považay (EV Group), Thomas Uhrmann (EV Group), Michael Josef Gruber (EV Group), Bernd Thallner (EV Group), and Markus Wimplinger (EV Group)

D2W Hybrid Bonding System Achieving High-Accuracy and High-Throughput with Minimal Configurations 420
Kentaro Mihara (Toray Engineering. Co., Ltd., Japan), Takashi Hare (Toray Engineering. Co., Ltd., Japan), Hirofumi Sakai (Toray Engineering. Co., Ltd., Japan), Shimpei Aoki (Toray Engineering. Co., Ltd., Japan), Toyoharu Terada (Toray Engineering. Co., Ltd., Japan), Mariappan Murugesan (Tohoku University, Japan), Hiryuki Hashimoto (Tohoku University, Japan), Hisashi Kino (Tohoku University, Japan), Tetsu Tanaka (Tohoku University, Japan), Takafumi Fukushima (Tohoku University, Japan), Fumihiro Inoue (Yokohama National University, Japan), and Akira Uedono (University of Tsukuba, Japan)

Session 11: Next-Generation Artificial Intelligence, Quantum Computing, and Secure Packaging

Reworkable Superconducting Qubit Package for Quantum Computing 427
Rabindra Das (MIT Lincoln Laboratory), John Cummings (MIT Lincoln Laboratory), Thomas Hazard (MIT Lincoln Laboratory), Danna Rosenberg (MIT Lincoln Laboratory), David Conway (MIT Lincoln Laboratory), Shireen Warnock (MIT Lincoln Laboratory), Michael Gingras (MIT Lincoln Laboratory), Bethany Huffman (MIT Lincoln Laboratory), Cyrus Hirjibehedin (MIT Lincoln Laboratory), Steven Weber (MIT Lincoln Laboratory), Jonilyn Yoder (MIT Lincoln Laboratory), and Mollie Schwartz (MIT Lincoln Laboratory)

Key Technologies and Design Aspects for Wafer Level Packaging of High Performance Computing Modules 433
Kai Zoschke (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Hermann Oppermann (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Michael Schiffer (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Ivan Ndip (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Karl-Friedrich Becker (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Marius Adler (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Alexander Gäbler (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Uwe Maaß (Fraunhofer Institute for Reliability and Microintegration IZM, Germany), Gianna Paulin (Integrated Systems Laboratory (IIS) - ETH Zurich, Switzerland), and Walter Kocon (GlobalFoundries, Fishkill, USA)

Fine Pitch Nb-Nb Direct Bonding for Quantum Applications 441

Pablo Renaud (Univ. Grenoble Alpes CEA, LETI, France), Christophe Dubarry (Univ. Grenoble Alpes CEA, LETI, France), Nicolas Bresson (Univ. Grenoble Alpes CEA, LETI, France), Edouard Deschaseaux (Univ. Grenoble Alpes CEA, LETI, France), Frank Fournel (Univ. Grenoble Alpes CEA, LETI, France), Christophe Morales (Univ. Grenoble Alpes CEA, LETI, France), Karine Abadie (Univ. Grenoble Alpes CEA, LETI, France), Candice Thomas (Univ. Grenoble Alpes CEA, LETI, France), and Jean Charbonnier (Univ. Grenoble Alpes CEA, LETI, France)

Si Interposer With Cu TSVs on Cu Substrate Thermally and Electrically Anchoring Qubit Chips in Millikelvin Assembly 447

Misato Taguchi (Kobe University, Japan), Takaaki Okidono (Kobe University, Japan), Takuji Miki (Kobe University, Japan), and Makoto Nagata (Kobe University, Japan)

Novel Approach for 3D Defect Detection and Metrology of HBMs Using Minimum Labeled Data ...N/A

*Ziyuan Zhao (Institute for Infocomm Research (I2R), A*STAR, Singapore), Qiyu Wei (Institute for Infocomm Research (I2R), A*STAR, Singapore), Jie Wang (Institute for Infocomm Research (I2R), A*STAR, Singapore), Richard Chang (Institute for Infocomm Research (I2R), A*STAR, Singapore), Xulei Yang (Institute for Infocomm Research (I2R), A*STAR, Singapore), Chong Ser Choong (Institute of Microelectronics (IME), A*STAR, Singapore), and Ramanpreet Singh Pahwa (Institute for Infocomm Research (I2R), A*STAR, Singapore)*

Design and Fabrication of 2.5D Cryogenic Interposer with Integrated Superconducting TSVs and Resonators 458

*HongYu Li (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), King-Jien Chui (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Simon Chun Kiat Goh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Rangga Perdana Budoyo (Centre for Quantum Technologies, NUS, Singapore), Nguyen Hoang Long (School of Physical and Mathematical Sciences, NTU, Singapore), Yong Chyn Ng (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Daniel Lau (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), B. N. Jaafar (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Yuanzheng Paul Tan (School of Physical and Mathematical Sciences, NTU, Singapore), and Rainer Dumke (School of Physical and Mathematical Sciences, NTU, Singapore)*

PQC-HI: PQC-Enabled Chiplet Authentication and Key Exchange in Heterogeneous Integration 464

Md Sami Ul Islam Sami (University of Florida, USA), Kimia Zamiri Azar (University of Florida, USA), Hadi Mardani Kamali (University of Florida, USA), Farimah Farahmandi (University of Florida, USA), and Mark Tehranipoor (University of Florida, USA)

Session 12: Artificial Intelligence and Advanced Modeling Approaches

Machine-Learning Guided Strain-Relief Patterns for Maximizing Stretchability of Printed Conductors 472
Rui Chen (Eastern Michigan University) and Suresh K. Sitaraman (Georgia Institute of Technology)

Development of Real-Time Thermal Monitoring of GaN-Based Power Inverter Modules Using Digital Twin 478
*Bin He (Institute of Microelectronics (IME), Agency for Science, Technology & Research (A*STAR), Republic of Singapore), Jaydeep Saha (National University of Singapore, Republic of Singapore), Rahul Sadanand Bhujade (National University of Singapore, Republic of Singapore), Gongyue Tang (Institute of Microelectronics (IME), Agency for Science, Technology & Research (A*STAR), Republic of Singapore), and Sanjib Kumar Panda (National University of Singapore, Republic of Singapore)*

Creep Parameters for Solder Interconnects by Nanoindentation Inverse-FEA Method 486
Shidong Li (IBM Corporation, USA), Christine Taylor (IBM Corporation, USA), and Charles Arvin (IBM Corporation, USA)

Deep Convolution Neural Networks for Automatic Detection of Defects Which Impact Hybrid Bonding Yield 491
Oliver Zhao (Adeia, Inc., USA), Dominik Suwito (Adeia, Inc., USA), Bongsub Lee (Adeia, Inc., USA), Thomas Workman (Adeia, Inc., USA), and Laura Mirkarimi (Adeia, Inc., USA)

Experimentally Validated Thermal Modeling Prediction for BEOL and BSPDN Stacks 498
Xinyue Chang (KU Leuven, Belgium; Imec, Belgium), Herman Oprins (Imec, Belgium), Bjorn Vermeersch (Imec, Belgium), Vladimir Cherman (Imec, Belgium), Melina Lofrano (Imec, Belgium), Seongho Park (Imec, Belgium), Zsolt Tokei (Imec, Belgium), and Ingrid De Wolf (KU Leuven, Belgium; Imec, Belgium)

Analysis of Mechanical Behavior of Hybrid SAC-LTS Joints Under Temperature Cycling with a Modified Garofalo Creep Model Based on Bi Concentration 506
Souvik Chakraborty (Auburn University, USA), Yaxiong Chen (NXP Semiconductors, USA), Gaurav Sharma (NXP Semiconductors, USA), Abdullah Fahim (NXP Semiconductors, USA), Torsten Hauck (NXP Semiconductors, Germany), Ronit Das (Binghamton University, USA), Atif Mahmood (Binghamton University, USA), Jeffrey C. Suhling (Auburn University, USA), and Peter Borgesen (Binghamton University, USA)

ILD Crack Mechanical Reliability Mitigation .... N/A
Yutaka Suzuki (Worldwide Semiconductor Packaging Texas Instruments Incorporated, USA), Jaimal Williamson (Worldwide Semiconductor Packaging Texas Instruments Incorporated, USA), and Rajen Murugan (Worldwide Semiconductor Packaging Texas Instruments Incorporated, USA)

Session 13: Next-Generation Substrate Manufacturing Technologies

Development of Next-Generation Chemical Mechanical Planarization Process for Panel-Level Heterogeneous Integration 519

Francoise Angoua (Intel Corporation, USA), Aaditya Candadai (Intel Corporation, USA), Daniel Rosales-Yeomans (Intel Corporation, USA), Yosef Kornbluth (Intel Corporation, USA), Dilan Seneviratne (Intel Corporation, USA), and Rahul Manepalli (Intel Corporation, USA)

Dry Processes to form Fine Features on Advanced Substrates 523

Wen Xiao (Applied Materials, Inc., USA), Cindy Mora (Applied Materials, Inc., USA), Nicholas Loo (Applied Materials, Inc., Singapore), Qin Zhong (Applied Materials, Inc., USA), Anindarupa Chunder (Applied Materials, Inc., USA), Weihua Qing (Applied Materials, Inc., USA), Sik Hin Chi (Applied Materials, Inc., Singapore), Cheng Sun (Applied Materials, Inc., Singapore), Carl Li (Applied Materials, Inc., USA), Craig Rosslee (Applied Materials, Inc., USA), Harish V Penmethsa (Applied Materials, Inc., USA), and Jeff Turner (Applied Materials, Inc., USA)

Direct Laser Patterning Using Excimer Laser on Polyimide Compositions With Low Dielectric Properties and Good Flexibility for Redistribution Layer 527

Kanta Wataji (Gigaphoton Inc., Japan), Akira Suwa (Gigaphpton Inc., Japan), Junichi Fujimoto (Gigaphpton Inc., Japan), Yasufumi Kawasuji (Gigaphpton Inc., Japan), Takashi Yamaguchi (ARAKAWA CHEMICAL INDUSTRIES, LTD., Japan), Taiyo Nakamura (ARAKAWA CHEMICAL INDUSTRIES, LTD., Japan), Takashi Tasaki (ARAKAWA CHEMICAL INDUSTRIES, LTD., Japan), and Masaru Sasago (Osaka Metropolitan Univ., Japan)

New Power Delivery Network(PDN) Approach for Extremely Large FC-BGA with Organic Substrate Based on over 1mm-thick Core 533

Kyojin Hwang (Samsung Electronics, South Korea), Woobin Jung (Samsung Electronics, South Korea), Junghwa Kim (Samsung Electronics, South Korea), Heeseok Lee (Samsung Electronics, South Korea), Junso Pak (Samsung Electronics, South Korea), and Jisoo Hwang (Samsung Electronics, South Korea)

X-ray Photoelectron Spectroscopy (XPS) Investigations to Monitor the Surface Chemistry During Palladium-Free Colloidal Copper Activation 539

Ibbi Y. Ahmet (Atotech Deutschland GmbH & Co. KG, Materials Solutions Division, MKS Instruments, Germany), André Beyer (Atotech Deutschland GmbH & Co. KG, Materials Solutions Division, MKS Instruments, Germany), Laurence J. Gregoriades (Atotech Deutschland GmbH & Co. KG, Materials Solutions Division, MKS Instruments, Germany), Julia Lehmann (Atotech Deutschland GmbH & Co. KG, Materials Solutions Division, MKS Instruments, Germany), and Yvonne Welz (Atotech Deutschland GmbH & Co. KG, Materials Solutions Division, MKS Instruments, Germany)

Development of Glass Core Substrate with the Stress Analysis, Transmission Characteristics and Reliability 546

Koji Fujimoto (DNP Co., Ltd., Japan), Yashuhiro Okawa (DNP Co., Ltd., Japan), Takahiro Tai (DNP Co., Ltd., Japan), and Satoru Kuramochi (DNP Co., Ltd., Japan)

High Aspect Ratio (AR) Through Glass Via (TGV) Etch Performance on Glass Core Substrates for High Density 3D Advanced Packaging Applications 551
Sung Jin Kim (Absolics Inc, USA), Venugopal Govindarajulu (Yield Engineering Systems, USA), Coby Tao (Yield Engineering Systems, USA), Aneelman Brar (Yield Engineering Systems, USA), and Zia Karim (Yield Engineering Systems, USA)

Session 14: Breakthrough Ultra-Fine Pitch Redistribution Layer and Solder Bumping Technologies

A Study on Improvement and Extension of Fine-Pitch Micro-Bump Interconnects Technology: New Metallurgy & Flux-Less Oxide-Removal Laser Assembly (FLOLA) 556
Seok-Geun Ahn (Samsung Electronics Co., Ltd., South Korea), Ju-Hyeon Oh (Samsung Electronics Co., Ltd., South Korea), Gwang-Jae Jeon (Samsung Electronics Co., Ltd., South Korea), Dae-Ho Lee (Samsung Electronics Co., Ltd., South Korea), and Seok-Hyun Lee (Samsung Electronics Co., Ltd., South Korea)

A Novel Copper Microporous-Assisted Bonding Method for Fine-Pitch Cu/Sn Microbump 3D Interconnects 563
Keyu Wang (Purdue University, USA), Shuhang Lyu (Purdue University, USA), and Tiwei Wei (Purdue University, USA)

Challenges and Innovations in Dual Damascene Polymer RDL with 2 um Pitch and Beyond 571
Benjamin D. Briggs (Applied Materials, Inc, USA), Ryan Ley (Applied Materials, Inc, USA), Chris Bencher (Applied Materials, Inc, USA), Roger Quon (Applied Materials, Inc, USA), CC Chuang (Applied Materials, Taiwan), Peng Suo (Applied Materials, Singapore), Andy Chang Bum Yong (Applied Materials, Singapore), Luisa Bozano (Applied Materials, Inc, USA), Jorge Fernandez (Applied Materials, Inc, USA), Prayudi Lianto (Applied Materials, Singapore), Niranjan Khasgiwale (Applied Materials, Inc, USA), and Siddarth Krishnan (Applied Materials, Inc, USA)

Void Migration Kinetics in Fine Line Cu RDL Under Electric Current Stressing and the Improvement of Electromigration Reliability by Polyimide Passivation 576
Yen-Cheng Huang (National Cheng Kung University, Taiwan), Min-Yan Tsai (ASE Group, Taiwan), Ting-Chun Lin (ASE Group, Taiwan), Yung-Sheng Lin (ASE Group, Taiwan), Chen-Chao Wang (ASE Group, Taiwan), Chih-Pin Hung (ASE Group, Taiwan), and Kwang-Lung Lin (National Cheng Kung University, Taiwan)

Reliable Chiplet Integration on High Density Laminate (2.X D) for AI Hardware 581
Divya Taneja (IBM Infrastructure, Canada), Jonathan Grenier (IBM Infrastructure, Canada), Joseph Ross (IBM Research, USA), Horiyuki Mori (IBM Research, Japan), Sathya Raghvan (IBM Research, USA), Brian Quinlan (IBM Infrastructure, USA), Isabel De Sousa (IBM Infrastructure, Canada), Thomas Wassick (IBM Infrastructure, USA), and Griselda Bonilla (IBM Research, USa)

Zero-Misalignment Technology Achieves 333 IO/mm/layer on Mold 587
Veronica Strong (Intel Corp., USA), Trianggono Widodo (Intel Corp., USA), Holly Sawyer (Intel Corp., USA), Carolyn Aubertine (Intel Corp., USA), Aleksandar Aleksov (Intel Corp., USA), and Johanna Swan (Intel Corp., USA)

Additive Manufacturing of High-Density (2.5 Micrometer L/S) Ag-Cu Stacked Interconnects on Organic Substrates 592
Shrivani Pandiya (University of Sherbrooke, Canada), Christophe Sansregret (Centre de Collaboration MiQro Innovation, Canada), Isabel De Sousa (IBM, Canada), Serge Ecoffey (University of Sherbrooke, Canada), Yann Beillard (University of Sherbrooke, Canada), and Dominique Drouin (University of Sherbrooke, Canada)

Session 15: Novel Materials and Process for Hybrid Bonding

Towards Standardization of Hybrid Bonding Interface: In-Depth Study of Dielectrics on Direct Bonding 599
Yi Yang (Intel Corporation), Xavier F. Brun (Intel Corporation), Marc H. Weber (Washington State University), and Marco Flores (Arizona State University)

Demonstration of Low Temperature Cu-Cu Hybrid Bonding Using A Novel Thin Polymer 606
Yasuhisa Kayaba (Mitsui Chemicals, Inc., Japan), Takuo Shikama (Mitsui Chemicals, Inc., Japan), Wataru Okada (Mitsui Chemicals, Inc., Japan), Kahori Tamura (Mitsui Chemicals, Inc., Japan), Yuzo Nakamura (Mitsui Chemicals, Inc., Japan), Yutaka Hisamune (Mitsui Chemicals, Inc., Japan), and Rikia Furusho (Mitsui Chemicals, Inc., Japan)

Process Challenges in Thin Wafers Fabrication with Double Side Hybrid Bond Pads for Chip Stacking 614
*Dileep Kumar Mishra (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Vasarla Nagendra Sekhar (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), B.S.S. Chandra Rao (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Ser Choong Chong (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), and Vempati Srinivasa Rao (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore)*

Development of Low Temperature Processable Polyimides for Organic Hybrid Bonding Applications 620
Kota Nomura (Electric & Imaging Materials Res. Labs. Toray Industries, Inc., Japan), Masaya Jukei (Electric & Imaging Materials Res. Labs. Toray Industries, Inc., Japan), Takenori Fujiwara (Toray Singapore Research Center, Toray International Singapore Pte. Lte., Singapore), Hitoshi Araki (Electric & Imaging Materials Res. Labs. Toray Industries, Inc., Japan), Tomoyuki Honda (Toray Industries, Inc., Tokyo, Japan), and Yu Shoji (Electric & Imaging Materials Res. Labs. Toray Industries, Inc., Japan)

Effect of (111) Surface Ratio on the Bonding Quality of Cu-Cu Joints 626
Jian-Yuan Huang (National Yang Ming Chiao Tung University, Taiwan) and Chih Chen (National Yang Ming Chiao Tung University, Taiwan)

Copper Microstructure Optimization for Fine Pitch Low Temperature Cu/SiO_2 Hybrid Bonding 631
Marie Maubert (Univ Grenoble Alpes CEA-Leti, France), Mathilde Gottardi (Univ Grenoble Alpes CEA-Leti, France), Pierre-Emile Philip (Univ Grenoble Alpes CEA-Leti, France), Emilie Fragnaud (Univ Grenoble Alpes CEA-Leti, France), Gilles Romero (Univ Grenoble Alpes CEA-Leti, France), Arnaud Cornelis (Univ Grenoble Alpes CEA-Leti, France), Hadi Hijazi (Univ Grenoble Alpes CEA-Leti, France), Frank Fournel (Univ Grenoble Alpes CEA-Leti, France), and Maria-Luisa Calvo-Muñoz (Univ Grenoble Alpes CEA-Leti, France)

Multi-tier Die Stacking Through Collective die-to-Wafer Hybrid Bonding 637
Koen Kennes (imec, Belgium), Ye Lin (imec, Belgium), Samuel Suhard (imec, Belgium), Pieter Bex (imec, Belgium), Dieter H. Cuypers (imec, Belgium), Alice Guerrero (Brewer Science, Inc, USA), Dennis Bumueller (SUSS MicroTex Lithography GmbH, Germany), Alain Phommahaxay (imec, Belgium), Gerald Beyer (imec, Belgium), and Eric Beyne (imec, Belgium)

Session 16: Reliability of High-Density and High-Power Packages

Structural Characterization of 2.5D System in Package Combined with High Bandwidth Memory for Enhanced Quality and Reliability 643
Byoungdo Lee (SK hynix Inc., Republic of Korea), Jinwoo Choi (SK hynix Inc., Republic of Korea), Sangyong Lee (SK hynix Inc., Republic of Korea), Jinwoo Park (SK hynix Inc., Republic of Korea), Jihoon Kang (SK hynix Inc., Republic of Korea), Unoh Kwon (SK hynix Inc., Republic of Korea), Gyujei Lee (SK hynix Inc., Republic of Korea), and Kangwook Lee (SK hynix Inc., Republic of Korea)

Reliability Investigations of Advanced Photosensitive Polymer based RDL Processes Protected by Inorganic Capping Layers 647
Emmanuel Chery (imec, Belgium), Ritwik Bhatia (Veeco, USA), Ganesh Sundaram (Veeco, USA), Nelson Pinho (imec, Belgium), and Eric Beyne (imec, Belgium)

Alternative Techniques for Cross-Sectioning and Quality Analysis of Solder-TIM Joints with Soft Indium Alloys 654
Ali Davoodabadi (Universal Instruments Corporation, USA), Daniel VanHart (Universal Instruments Corporation, USA), and Peter McClure (Universal Instruments Corporation, USA)

Fusing Current Characterization of Various Cu RDL Designs in Wafer Level Packages 661
JeongMin Ju (Amkor Technology, Inc., Korea), Nathan Whitchurch (Amkor Technology, Inc., USA), JiYeon Yoon (Amkor Technology, Inc., Korea), EunSook Sohn (Amkor Technology, Inc., Korea), and KyungRok Park (Amkor Technology, Inc., Korea)

Electromigration Failure Mechanisms of Cu-Cu Joints at Low Stressing Temperatures 665
Shih-Chi Yang (National Yang Ming Chiao Tung University, Taiwan) and Chih Chen (National Yang Ming Chiao Tung University, Taiwan)

A Data-Driven Machine Learning Model for the Stress-Strain Behavior of Single Grain SAC305 Solder Joints 670
Debabrata Mondal (Auburn University, USA), Jeffrey C. Suhling (Auburn University, USA), Elham Mirkoohi (Auburn University, USA), and Pradeep Lall (Auburn University, USA)

BGA Electromigration Behavior and why it has Become the Bottleneck 678
Riet Labie (Imec, Belgium), Chinmay Nawghane (Imec, Belgium), Dimitrios Tsiakos (Imec, Belgium), Jan Mertens (Imec, Belgium), Eric Tremble (Marvell, USA), Richard Graf (Marvell, USA), and Wolfgang Sauter (Marvell, USA)

Session 17: Advanced Additive Manufacturing for Printed Electronics and Integrated Systems

Embedded RF Packaging Via Ceramic 3D Printing and Printed Electronics Additive Manufacturing 685
Abdullah S. Obeidat (The State University of New York, USA), Ashraf Umar (The State University of New York, USA), Zhi Dou (The State University of New York, USA), Firas Alshatnawi (The State University of New York, USA), Riadh Al-Haidari (The State University of New York, USA), Waleed Al-Shaibani (The State University of New York, USA), Mohammed Alhendi (The State University of New York, USA), Mohamed Y. Abdelatty (The State University of New York, USA), Linda Boyd (GE Aerospace Research, USA), Cathleen Hoel (GE Aerospace Research, USA), Genaro Soto Valle Angulo (GE Aerospace Research, USA; Georgia Institute of Technology), Thomas Budka (GE Aerospace Research, USA), Jason Case (GE Aerospace Research, USA), Joseph Iannotti (GE Aerospace Research, USA), Felippe Pavinatto (GE Aerospace Research, USA), and Mark D. Poliks (The State University of New York, USA)

A CMOS Nanosensing System For Continuous Brain Multianalyte Monitoring 693
Yue Gu (Yale University, USA), Jesus Maldonado Vazquez (Yale University, USA), De-Shaine Murray (Yale University, USA), Hitten Zaveri (Yale University, USA), and Dennis Spencer (Yale University, USA)

Additively Manufactured RF Interconnects for D-Band/sub-THz Applications 698
Genaro Soto-Valle (Georgia Institute of Technology, USA), Nikolas Roeske (Georgia Institute of Technology, USA), Kexin Hu (Georgia Institute of Technology, USA), Yaw A. Mensah (Georgia Institute of Technology, USA), John D. Cressler (Georgia Institute of Technology, USA), and Manos M. Tentzeris (Georgia Institute of Technology, USA)

Direct-Write NiO RRAM Cells 704
Jordan Howard-Jennings (Binghamton University, USA), Riadh Al-Haidari (Binghamton University, USa), Emuobosan Enakerakpo (Binghamton University, USA), Abdullah Obeidat (Binghamton University, USA), Kevin Bell (Lockheed Martin Rotary and Mission Systems, Lockheed Martin Corporation, USA), Tom Rovere (Lockheed Martin Rotary and Mission Systems, Lockheed Martin Corporation, USA), Stephen Gonya (Binghamton University, USA), Mohammed Alhendi (Binghamton University, USA), and Mark Poliks (Binghamton University, USA)

Micro-3D-Printed Packaging Substrates With Embedded Through Holes for Organic Interposers ... 710
Jimin Kwon (Ulsan National Institute of Science and Technology (UNIST), Republic of Korea), Nahyeon Kim (Ulsan National Institute of Science and Technology (UNIST), Republic of Korea), Haksoon Jung (Ulsan National Institute of Science and Technology (UNIST), Republic of Korea), Yongwoo Lee (Ulsan National Institute of Science and Technology (UNIST), Republic of Korea), Sungmin Eum (Ulsan National Institute of Science and Technology (UNIST), Republic of Korea), Yechan Han (Ulsan National Institute of Science and Technology (UNIST), Republic of Korea), Hyunjin Park (Korea Research Institute of Chemical Technology (KRICT), Republic of Korea), and Yunsik Park (Korea Electronics Technology Institute (KETI), Republic of Korea)

A Novel Fully Additive Fabrication Approach for Creating Double-Stacked Copper Spiral Inductors 715
Roghayeh Imani (Luleå Technical University, Sweden), Shailesh Singh Chouhan (Luleå Technical University, Sweden), and Jerker Delsing (Luleå Technical University, Sweden)

A Flexible Composite Heat Sink Embedded Ag Microchannels for Potential Flexible Electronic Applications 722
Han Cai (Shanghai Jiao Tong University, China), Yongjin Wu (Shanghai Jiao Tong University, China), Dongdong Xie (Shanghai Jiao Tong University, China), Jiangbo Luo (Shanghai Aerospace Electronic and Communication Equipment Research Institute, China), Yanxin Zhang (Shanghai Jiao Tong University, China), Yunna Sun (Shanghai Jiao Tong University, China), Zhuoqing Yang (Shanghai Jiao Tong University, China), and Guifu Ding (Shanghai Jiao Tong University, China)

Session 18: Radio Frequency Antenna-in-Package and Component Design

Design and Simulation Study of 300-GHz Molded Patch Antenna in Packaging Substrate 727
Harshpreet S. Bakshi (Texas Instruments Inc., USA), Rajen M. Murugan (Texas Instruments Inc., USA), and Sylvester Ankamah-Kusi (Texas Instruments Inc., USA)

Wideband Antennas on Thin-Film Packaging Substrates for 140 GHz 6G Applications 732
Thi Huyen Le (Fraunhofer Institute for Reliability and Microintegration, Germany), Michael Philipp Kaiser (Fraunhofer Institute for Reliability and Microintegration, Germany), Julia-Marie Koeszegi (Fraunhofer Institute for Reliability and Microintegration, Germany), Kavin Senthil Murugesan (Fraunhofer Institute for Reliability and Microintegration, Germany), Lutz Gerhold (Fraunhofer Institute for Reliability and Microintegration, Germany), Habib Hichri (Ajinomoto Fine-Techno USA Corporation, USA), Ryohei Oishi (Ajinomoto Corporation Inc., Japan), Reki Nakano (Ajinomoto Corporation Inc., Japan), Ivan Ndip (Fraunhofer Institute for Reliability and Microintegration, Germany; Brandenburg University of Technology Cottbus-Senftenberg (BTU), Germany), and Martin Schneider-Ramelow (Fraunhofer Institute for Reliability and Microintegration; Technical University Berlin, Germany)

Miniaturized Highly-Efficient Substrate Integrated Waveguide (SIW) Cavity Slot Antenna at 28GHz Based on Through Fused-Silica Via (TFS) Technology 738
Hanna Jang (University of Florida, USA), Payman Pahlavan (University of Florida, USA), and Yong-Kyu Yoon (University of Florida, USA)

A Compact mmWave 1x4 Antenna Array Design with Shorted Parasitic Elements for 5G AiP Applications 743
Sheng-Chi Hsieh (ASE Group)

High-Performance Polymer Microwave Fiber Coupler in eWLB Package for Sub-THz Communication 748
Vasileios Liakonis (Infineon Technologies AG, Germany), Yannis Papananos (National Technical University of Athens, Greece), Maciej Wojnowski (Infineon Technologies AG, Germany), and Walter Hartner (Infineon Technologies AG, Germany)

RF Modelling and Characterization of TSVs and Inductive Links of Hybrid Bonded Devices 754
Xiao Sun (imec, Belgium), Chin-Ya Su (imec, Belgium), Shih-Hung Chen (imec, Belgium), Soon Aik Chew (imec, Belgium), Boyao Zhang (imec, Belgium), and Eric Beyne (imec, Belgium)

Terahertz Metasurfaces on Flex Using Aerosol Jet Printing and a Novel Parylene Lift-off Process 760
Sambit Kumar Ghosh (Michigan State University, USA), Ethan Kepros (Michigan State University, USA), Yihang Chu (Michigan State University, USA), Bhargav Avireni (Michigan State University, USA), Brian Wright (Michigan State University, USA), and Premjeet Chahal (Michigan State University, USA)

Session 19: 3D Integration Copper-Copper Hybrid Bonding

A Study of Low Temperature SoIC Targeting 200 nm Bond Pitch 765
Wei-Ming Wang (Taiwan Semiconductor Manufacturing Company, Ltd.), C.W. Yeh (Taiwan Semiconductor Manufacturing Company, Ltd.), Han-Jong Chia (Taiwan Semiconductor Manufacturing Company, Ltd.), R.F. Tsui (Taiwan Semiconductor Manufacturing Company, Ltd.), Ji James Cui (Taiwan Semiconductor Manufacturing Company, Ltd.), Chih-Hang Tung (Taiwan Semiconductor Manufacturing Company, Ltd.), Kuo-Chung Yee (Taiwan Semiconductor Manufacturing Company, Ltd.), and Douglas C.H. Yu (Taiwan Semiconductor Manufacturing Company, Ltd.)

Low Resistance and High Isolation HD TSV for 3-Layer CMOS Image Sensors 771
Stéphan Borel (Univ. Grenoble Alpes, France), Myriam Assous (Univ. Grenoble Alpes, France), Rémi Vélard (Univ. Grenoble Alpes, France), Jerzy-Javier Suarez-Berru (Univ. Grenoble Alpes, France), Stéphane Nicolas (Univ. Grenoble Alpes, France), Jérôme Dechamp (Univ. Grenoble Alpes, France), Renan Bouis (Univ. Grenoble Alpes, France), Lionel Vignoud (Univ. Grenoble Alpes, France), Paul Valentin (Univ. Grenoble Alpes, France), Jérémy Marchand (Univ. Grenoble Alpes, France), Antonio Roman (Univ. Grenoble Alpes, France), and Messaoud Bedjaoui (Univ. Grenoble Alpes, France)

Enabling Die-to-Wafer Hybrid Bonding for the Next Generation Advanced 3D Packaging 778
Raymond Hung (Applied Materials, Inc.), Gilbert See (Applied Materials, Inc.), Ying Wang (Applied Materials, Inc), Chang Bum Yong (Applied Materials, Inc), Ke Zheng (Applied Materials, Inc.), Yauloong Chang (Applied Materials, Inc.), Ruiping Wang (Applied Materials, Inc.), Arvind Sundarrajan (Applied Materials, Inc.), Jonathan Abdilla (BE Semiconductor Industries N.V), Djuro Bikaljevic (BE Semiconductor Industries N.V), and Manfred Glantschnig (BE Semiconductor Industries N.V)

Process Development and Performance Benefits of 0.64-0.36 um Pitch Hybrid Bonding on Intel Process 784
Tushar Talukdar (Intel Corporation, USA), Adel Elsherbini (Intel Corporation, USA), Brandon Rawlings (Intel Corporation, USA), Richard Vreeland (Intel Corporation, USA), William Brezinski (Intel Corporation, USA), Siyan Dong (Intel Corporation, USA), Haris Khan Niazi (Intel Corporation, USA), Pilin Liu (Intel Corporation, USA), Yi Shi (Intel Corporation, USA), Natasha Tabassum (Intel Corporation, USA), Ajay Sathe (Intel Corporation, USA), Taiwo Ajayi (Intel Corporation, USA), Felipe Bedoya (Intel Corporation, USA), Sathya Narasimman Tiagaraj (Intel Corporation, USA), Gerald Pasdast (Intel Corporation, USA), Kimin Jun (Intel Corporation, USA), Xavier Brun (Intel Corporation, USA), and Johanna Swan (Intel Corporation, USA)

Methodologies for Characterization of W2W Bonding Strength 790
Mario Gonzalez (imec, Belgium), Kris Vanstreels (imec, Belgium), Oguzhan Okudur (imec, Belgium), Serena Iacovo (imec, Belgium), and Eric Beyne (imec, Belgium)

3.5D Advanced Packaging Enabling Heterogenous Integration of HPC and AI Accelerators 798
Chandra Sekhar Mandalapu (AMD, USA), Chintan Buch (AMD, USA), Priyal Shah (AMD, India), Roden Topacio (AMD, Canada), Patrick Cheng (AMD, Taiwan), Liwei Wang (AMD, USA), Raja Swaminathan (AMD, USA), Alan Smith (AMD, USA), John Wuu (AMD, USA), Kaushik Mysore (AMD, USA), and Arsalan Alam (AMD, USA)

Sub-0.5 µm Pitch Scaling of W2W Cu/Dielectric Hybrid Bonding 803
*Hemanth Kumar Cheemalamarri (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Arvind Sundaram (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Sandra San (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Anh Tran Van Nhat (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Chandra Rao Bhesetti (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Gim Guan Chen (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Haitao Yu (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Raju Mani (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Ping Luo (Institute of Material Research (IMRE), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Chaeeun Lee (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Srinivasa Rao Vempati (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), and Navab Singh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore)*

Session 20: Novel High-Density 3D & Thru-Via Structures and Processes

Integration of Planarized Nb-Based Vias to form a Multi-level Superconducting Back-end-of-Line 809
Candice Thomas (Univ. Grenoble Alpes, France), Edouard Deschaseaux (Univ. Grenoble Alpes, France), Rémi Vélard (Univ. Grenoble Alpes, France), Giovanni Romano (Univ. Grenoble Alpes, France), Jean-Philippe Michel (Univ. Grenoble Alpes, France), Norman Vivien (Univ. Grenoble Alpes, France), Richard Souil (Univ. Grenoble Alpes, France), Cassandre Beluffi (Univ. Grenoble Alpes, France), Simon Guignard (Univ. Grenoble Alpes, France), Catherine Pellissier (Univ. Grenoble Alpes, France), and Jean Charbonnier (Univ. Grenoble Alpes, France)

Observation of Thermal Expansion Behavior of Nanotwinned-Cu/SiO2 & Regular-Cu/SiO2 Hybrid Structure via In-Situ Heating AFM 816
Huai-En Lin (National Yang Ming Chiao Tung University, Taiwan), Wei-Lan Chiu (Industrial Technology Research Institute, Taiwan), Hsiang-Hung Chang (Industrial Technology Research Institute, Taiwan), and Chih Chen (National Yang Ming Chiao Tung University, Taiwan)

3D Interconnects for Quantum Computing 821
Jaber Derakhshandeh (IMEC, Belgium), Anish Dangol (IMEC, Belgium), Tassawar Hussain (IMEC, Belgium), Heiko Stegmann (Carl Zeiss Microscopy GmbH, Germany), A. M. Vadiraj (IMEC, Belgium), Prathamesh Dhakras (IMEC, Belgium), Thomas Witters (IMEC, Belgium), Ehsan Shafahian (IMEC, Belgium), Punith Kumar M K (IMEC, Belgium), Carine Gerets (IMEC, Belgium), Aleksandar Radisic (IMEC, Belgium), Aldrin Vaquilar (IMEC, Belgium), Aksel Goehnermeier (Carl Zeiss Microscopy GmbH, Germany), Danny Wan (IMEC, Belgium), Andy Miller (IMEC, Belgium), Anne Jourdain (IMEC, Belgium), Vladimir Cherman (IMEC, Belgium), Gerald Beyer (IMEC, Belgium), Eric Beyne (IMEC, Belgium), and Kristiaan De Greve (IMEC, Belgium)

Laser Micro Drilling of Around 3 Microns into Ajinomoto Build-up Film 829
Toshio Otsu (The University of Tokyo, Japan), Shuntaro Tani (The University of Tokyo, Japan), Shoko Nagayama (Ajinomoto Fine-Techno Co. Inc., Japan), Ryo Miyamoto (Ajinomoto Fine-Techno Co. Inc., Japan), George Okada (Spectronix Co., Japan), Naoyuki Nakamura (Mitsubishi Electric Co., Japan), Junichi Nishimae (Mitsubishi Electric Co., Japan), Hiroharu Tamaru (The University of Tokyo, Japan), and Yohei Kobayashi (The University of Tokyo, Japan)

Thermo-Mechanical Reliability Analysis and Raman Spectroscopy Characterization of Sub-Micron Through Silicon Vias (TSVs) for Backside Power Delivery in 3D Interconnects 834
Shuhang Lyu (Purdue University, USA), Thomas E. Beechem (Purdue University, USA), and Tiwei Wei (Purdue University, USA)

Organic Interposers Using Zero-Misalignment-Via Technology and Silicon Wafer Carriers for Large Area Wafer-Level Package Applications 842
Aleksandar Aleksov (Intel Corp., USA), Tushar Talukdar (Intel Corp., USA), Veronica Strong (Intel Corp., USA), Thomas Sounart (Intel Corp., USA), Holly Sawyer (Intel Corp., USA), Carolyn Aubertine (Intel Corp., USA), and Johanna Swan (Intel Corp., USA)

Bendability Enhancement and Miniaturization of Through-X Via (TXV) Based on Flexible FOWLP with Tiny Cu Pillar Assembly 849
Atsushi Shinoda (Tohoku University, Japan), Chang Liu (Tohoku University, Japan), Akihiro Tominaga (Tohoku University, Japan), Hisashi Kino (Tohoku University, Japan), Tetsu Tanaka (Tohoku University, Japan), and Takafumi Fukushima (Tohoku University, Japan)

Session 21: Innovations in Polymer Packaging Materials

Novel Sheet Molding Compound Technology for Wafer-Level Packaging to Overcome Wafer Warpage Issue 855
Yuki Sugiura (Nagase ChemteX Corporation, Japan), Daisuke Mori (Nagase ChemteX Corporation, Japan), Yasuhito Fujii (Nagase ChemteX Corporation, Japan), Kenta Imamura (Nagase America LLC, USA), Ippei Yamai (Nagase & Co., Ltd., Japan), Takashi Yagihashi (Nagase ChemteX Corporation, Japan), and Eiichi Nomura (Nagase ChemteX Corporation, Japan)

Development of UV-curable Molding Materials with Minimum Die-Shift for FOWLP/FOPLP 860
Markus Schindler (DELO Industrie Klebstoffe GmbH & Co. KGaA), Severin Ringelstetter (DELO Industrie Klebstoffe GmbH & Co. KGaA), Mariana Pires (EV Group E. Thallner GmbH), Mikhail Begel (EV Group E. Thallner GmbH), Andrea Kneidinger (EV Group E. Thallner GmbH), Florian Kleinpötzl (EV Group E. Thallner GmbH), Thomas Uhrmann (EV Group E. Thallner GmbH), Markus Wimplinger (EV Group E. Thallner GmbH), and Elisabeth Brandl (EV Group E. Thallner GmbH)

Temperature dependent Dielectric Characterization of Low Loss Thin Film Polymer up to sub-THz Bands 865
Kavin Senthil Murugesan (Fraunhofer Institute for Reliability and Microintegration, Germany), Jens Schneider (Fraunhofer Institute for Reliability and Microintegration, Germany), Thi Huyen Le (Fraunhofer Institute for Reliability and Microintegration, Germany), Lutz Gerhold (Fraunhofer Institute for Reliability and Microintegration, Germany), Michael Philipp Kaiser (Fraunhofer Institute for Reliability and Microintegration, Germany), Julia-Marie Koeszegi (Fraunhofer Institute for Reliability and Microintegration, Germany), Habib Hichri (Ajinomoto Fine-Techno USA Corporation, USA), Ryohei Oishi (Ajinomoto Corporation Inc., Japan), Reki Nakano (Ajinomoto Corporation Inc., Japan), Ivan Ndip (Fraunhofer Institute for Reliability and Microintegration /Brandenburg University of Technology (BTU) , Germany), and Martin Schneider-Ramelow (Reliability and Microintegration/Technical University (TU) Berlin, Germany)

Low-Temperature Polymer Hybrid Bonding with Nanoparticulated Cu and Photosensitive Acrylic Adhesive 871
Hirokatsu Sakamoto (Daicel Corporation, Japan), Tadashi Teranishi (Daicel Corporation, Japan), Rumi Nagai (Daicel Corporation, Japan), Ryo Itaya (Daicel Corporation, Japan), Hideaki Tamate (Tohoku MicroTec (T-Micro) Co., Ltd., Japan), Takafumi Fukushima (Tohoku University, Japan), and Akihiko Happoya (Daicel Corporation, Japan)

Development of New Concept Photo Imageable Dielectric Materials for Next-Generation Advanced Packaging 876
Kazuki Sato (TOKYO OHKA KOGYO CO., LTD.), Kazuaki Ebisawa (TOKYO OHKA KOGYO CO., LTD.), Makiko Irie (TOKYO OHKA KOGYO CO., LTD.), Atsushi Kubo (TOKYO OHKA KOGYO CO., LTD.), and Takashi Shimizu (School of Engineering, Utsunomiya University)

Development of Thick-Core Substrate Material for Cutting-Edge IC Packaging 881
Tomo Mugurma (Panasonic Industrial Devices Sales Company of America), Tom Shin (Panasonic Industrial Devices Sales Company of America), Masafumi Honma (Panasonic Industrial Devices Materials (Suzhow) Co.,Ltd.), Hirosuke Saito (Panasonic Industry Co., Ltd.), Genki Takahashi (Panasonic Industry Co., Ltd.), Jun Yasumoto (Panasonic Industry Co., Ltd.), Teppei Washio (Panasonic Industry Co., Ltd.), Yuichi Ishikawa (Panasonic Industry Co., Ltd.), Yutaka Tashiro (Panasonic Industry Co., Ltd.), Yoshiki Okushima (Panasonic Industry Co., Ltd.), Al Biruni Ahammad (Panasonic Industry Co., Ltd.), and Ryuji Takahashi (Panasonic Industry Co., Ltd.)

Development of Magnetic Molding Compound for Low Pressure Molding Inductors with Both Good Magnetic Properties and High Reliability 887
Hiroki Sonokawa (Resonac Corporation, Japan), Mika Tanaka (Resonac Corporation, Japan), Yoshinori Endo (Resonac Corporation, Japan), Teruo Ito (Resonac Corporation, Japan), and Takashi Inagaki (Resonac Corporation, Japan)

Session 22: Signal & Power Integrity for Advanced Packages and Systems

High Bandwidth and Energy Efficient Electrical-Optical System Integration Using COUPE Technology 893
Chih-Hsin Lu (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Chia-Chia Lin (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Tzu-Chun Tang (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Chung-Yi Lin (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Jay Chang (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Chung-Hao Tsai (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Harry Hsia (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), J.C. Twu (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), C.S. Liu (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Gene Wu (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), Kuo-Chung Yee (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C), and Douglas C.H. Yu (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C)

High Frequency Assessment of Djordjevic-Sarkar Model for Low Loss Package Dielectrics 898
Cemil S. Geyik (Intel Corporation, USA), Michael J. Hill (Intel Corporation, USA), Zhichao Zhang (Intel Corporation, USA), and Kemal Aygun (Intel Corporation, USA)

System Level Analysis and Design Optimization of Back-Side Power Delivery Network for Advanced Nodes 903
Kyunghwan Song (Foundry Business, Samsung Hwaseong-si, Republic of Korea), Sungwook Moon (Foundry Business, Samsung Hwaseong-si, Republic of Korea), Minseok Kang (Foundry Business, Samsung Hwaseong-si, Republic of Korea), Yongho Lee (Foundry Business, Samsung Hwaseong-si, Republic of Korea), Duhyoung Ahn (Foundry Business, Samsung Hwaseong-si, Republic of Korea), and Hyeonjin Kim (Foundry Business, Samsung Hwaseong-si, Republic of Korea)

PDN Impedance Optimization of AR/VR Systems: A Trade-off in VRM Bandwidth and Board Decoupling 908
Wendemagegnehu Beyene (Meta Platforms Inc., Reality Labs, USA), Ling Jiang (Meta Platforms Inc., Reality Labs, USA), Koichi Yamaguchi (Meta Platforms Inc., Reality Labs, USA), Xiaoping Liu (Meta Platforms Inc., Reality Labs, USA), Ashkan Hashemi (Meta Platforms Inc., Reality Labs, USA), and Jihong Ren (Meta Platforms Inc., Reality Labs, USA)

Physical-Based Verification of High-Speed Channel Crosstalk and Correlation with BER Measurements 913
Guan-Yu Lin (AMD, Taiwan), Po-Chen Lin (AMD, Taiwan), Chao-Chin Lee (AMD, Taiwan), Po-Wei Chiu (AMD, Taiwan), Jinsung Youn (AMD, USA), Youngsoo Lee (AMD, USA), Hong Shi (AMD, USA), Alan Fang (AMD, USA), and Santiago Asuncion (AMD, USA)

An Energy Efficient DDR5 I/O Performance Boost in Clamshell Configuration by Charge Pumping From Non-Target Device 917
Ryuichi Oikawa (Renesas Electronics, Japan)

Signal Integrity Analysis and Design Optimization Using Neural Networks 924
Juhitha Konduru (University of Illinois Urbana Champaign, USA), Oleg Mikulchenko (Intel Corporation, USA), Loke Yip Foo (Intel Corporation, Malaysia), and José E. Schutt-Ainé (University of Illinois Urbana Champaign, USA)

Session 23: Novel Bonding Technology for Advanced Assembly Substrates and Integration

Advanced Thermocompression Bonding on High Density Fan-Out Embedded Bridge Technology for HPC/AI/ML Applications 929
Wiwy Wudjud (Advanced Semiconductor Engineering, Inc., USA), ShuYu Lin (Advanced Semiconductor Engineering, Inc., Taiwan), Yungshun Chang (Advanced Semiconductor Engineering, Inc., Taiwan), Jean Yen (Advanced Semiconductor Engineering, Inc., Taiwan), Reno Liao (Advanced Semiconductor Engineering, Inc., Taiwan), Leohs Cheng (Advanced Semiconductor Engineering, Inc., Taiwan), Yihsien Wu (Advanced Semiconductor Engineering, Inc., Taiwan), Simon Yl Huang (Advanced Semiconductor Engineering, Inc., Taiwan), Jui Tzu Chen (Advanced Semiconductor Engineering, Inc., Taiwan), ChengYu Lee (Advanced Semiconductor Engineering, Inc., Taiwan), JoeyCl Huang (Advanced Semiconductor Engineering, Inc., Taiwan), and Lihong Cao (Advanced Semiconductor Engineering, Inc., USA)

Various Defect Mechanism Analysis for Optimization of Vacuum Fluxless Solder Reflow Performance Using 10 µm or Below Microbumps 936
Lei Jing (Yield Engineering Systems, USA), Alvin Lin (Yield Engineering Systems, USA), Xinxuan Tan (Yield Engineering Systems, USA), Anderson Chen (Yield Engineering Systems, Taiwan), Vladimir Kudriavtsev (Yield Engineering Systems, USA), Tapani Laaksonen (Yield Engineering Systems, USA), Zia Karim (Yield Engineering Systems, USA), and Chris Lane (Yield Engineering Systems, USA)

Chip-on-Wafer (CoW) Technology Utilizing Laser Assisted Bonding with Compression (LABC) for Bump Counts Exceeding 500,000 at a 20 µm Pitch 943
Kwang-Seong Choi (ETRI, Korea), Jiho Joo (ETRI, Korea), Gwang-Mun Choi (ETRI, Korea), Jungho Shin (ETRI, Korea), Chanmi Lee (ETRI, Korea), Ki-Seok Jang (ETRI, Korea), Jin-Hyuk Oh (ETRI, Korea), Ho-Gyeong Yun (ETRI, Korea), Seok Hwan Moon (ETRI, Korea), Ji Eun Jung (ETRI, Korea), Gaeun Lee (ETRI, Korea), and Yong-Sung Eom (ETRI, Korea)

Novel Molded FCBGA Package Platform for Highly Reliable Automotive Applications 949
Inrak Kim (Amkor Technology Korec, Inc., Republic of Korea), Nari Kim (Amkor Technology Korec, Inc., Republic of Korea), Gayoung Shin (Amkor Technology Korec, Inc., Republic of Korea), Youngdo Kweon (Amkor Technology, Inc., Republic of Korea), and Nathan Whitchurch (Amkor Technology, Inc., Republic of Korea)

Study of Fabrication and Reliability for 120 mm x 120 mm Extremely Large Advanced 2.5D Package 955
Kazue Hirano (Resonac Corporation, Japan), Dongchul Kang (Resonac Corporation, Japan), Masaki Takahashi (Resonac Corporation, Japan), Takahiro Iseki (Resonac Corporation, Japan), Kosuke Murai (Resonac Corporation, Japan), and Sadaaki Katoh (Resonac Corporation, Japan)

Thin Substrate Bonding 963
Partia Naghibi (HRL Laboratories, USA) and Gavin Chang (HRL Laboratories, USA)

High-Throughput Characterization of Nanoscale Topography for Hybrid Bonding by Optical Interferometry 969
Bongsub Lee (Adeia Inc., USA), Oliver Zhao (Adeia Inc., USA), Arianna Avellán (Adeia Inc., USA), Suhail Sadiq (Adeia Inc., USA), Gill Fountain (Adeia Inc., USA), Dominik Suwito (Adeia Inc., USA), Guilian Gao (Adeia Inc., USA), and Laura Mirkarimi (Adeia Inc., USA)

Session 24: Advances on Flex and Redistribution Layer Technologies and Warpage

Accurate Prediction of Solder Stresses/Strains in Multi-Layered Electronics Packages During Temperature Cycling 976
Mukunda Khanal (Lamar University, USA), Jenny Zhou (Lamar University, USA), and Xuejun Fan (Lamar University, USA)

Comparison of Sustainable and Non-Sustainable Ink Process-Performance Interactions for Additively Printed Circuits 982
Pradeep Lall (Auburn University), Ved Soni (Auburn University), Sabina Bimali (Auburn University), Daniel Karakitie (Auburn University), and Scott Miller (NextFlex National Manufacturing Institute)

Simulation and Metrological Applications for RDL Patterning Development of Glass Substrate. 990
Chang-Chun Lee (National Tsing Hua University, Taiwan), Jui-Chang Chuang (National Tsing Hua University, Taiwan), Chen-Tsai Yang (EOSL, Industrial Technology Research Institute, Taiwan), Chung-I-I Li (EOSL, Industrial Technology Research Institute, Taiwan), Shih-Hsien Lee (SAP, Applied Materials Tainan, Taiwan), and Shih-Hao Kuo (SAP, Applied Materials, Taiwan)

Monitoring of Wafer Thinning Induced in-die Mechanical Stress with Embedded Sensors for Heterogeneous Integration 996
Alberto Piadena (PDF Solutions Inc., Italy), Michele Quarantelli (PDF Solutions Inc., Italy), Tomasz Brozek (PDF Solutions Inc., USA), Sharad Saxena (PDF Solutions Inc., USA), Christopher Hess (PDF Solutions Inc., USA), Larg Weiland (PDF Solutions Inc., USA), Rakesh Vallishayee (PDF Solutions Inc., USA), Yuan Yu (PDF Solutions Inc., USA), and Andrzej Strojwas (PDF Solutions Inc., USA)

Investigation of Mechanical Reliability of Flexible/Stretchable Electronic Materials Using Multi-axial Stretch Techniques 1003
Nathan Morgan (University of Alabama in Huntsville), Kaushik Godbole (Georgia Institute of Technology), Benjamin Stewart (Georgia Institute of Technology), Suresh Sitaraman (Georgia Institute of Technology), and Nicholas Ginga (University of Alabama in Huntsville)

Optimized Simulation Methodology of Warpage and Localized Stress Hotspot Prediction for Assembly Risk Assessment 1011
Zhi Yang (Groq Inc, USA), Krishna Mellachervu (Ansys Inc, USA), Igor Arsovski (Groq Inc, USA), Clint Harames (Groq Inc, USA), and Jim Miller (Groq Inc, USA)

Analyzing the Influence of RDL Stack-up on Wafer Warpage in FOWLP Through Experimental and Numerical Investigations 1018
Saskia Huber (Fraunhofer IZM, Germany), Philipp Scheibe (Fraunhofer ASSID, Germany), Sükrücan Mutlu (Fraunhofer IZM, Germany), Olaf Wittler (Fraunhofer IZM, Germany), and Martin Schneider-Ramelow (Fraunhofer IZM, Germany)

Session 25: High-Performance Computing, Design Challenges, and Solutions

An Energy-Efficient Si-Integrated Micro-Cooler for High Power and Power-Density Computing Applications 1025
Yu-Jen Lien (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.), Cheng-Chieh Hsieh (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.), Terry Ku (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.), Li Wang (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.), Po-Ju Chen (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.), Kuo-Chung Yee (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.), and C. H. Douglas Yu (Taiwan Semiconductor Manufacturing Company, Ltd, R.O.C.)

High Power Thermal Test Vehicle with 2-Phase Cooling for AI Datacenters, 5G RAN, and EDGE Compute Nodes 1030
Yang Liu (Nokia Bell Labs, USA), Nagesh Basavanhally (Nokia Bell Labs, USA), Mark Earnshaw (Nokia Bell Labs, USA), Todd Salamon (Nokia Bell Labs, USA), Rick Papazian (Nokia Bell Labs, USA), Ting-Chen Hu (Nokia Bell Labs, USA), Mark Cappuzzo (Nokia Bell Labs, USA), Rose Kopf (Nokia Bell Labs, USA), David Apigo (Nokia Bell Labs, USA), Bob Farah (Nokia Bell Labs, USA), Syed Faisal (Nokia Bell Labs, USA), and Rishav Roy (Nokia Bell Labs, USA)

Block Level and Package Level Thermal Assessment for Back Side Power Delivery Network .. 1036
Melina Lofrano (imec, Belgium), Herman Oprins (imec, Belgium), Vladimir Cherman (imec, Belgium), Lisbeth Witters (imec, Belgium), Anne Jourdain (imec, Belgium), Geert Van der Plas (imec, Belgium), and Eric Beyne (imec, Belgium)

CoaxMIL 2.0 – Next Generation Coaxial Magnetic Integrated Inductors for Higher Efficiency Fully Integrated Voltage Regulator 1044
Beomseok Choi (Intel Corporation, USA), Jaeil Baek (Intel Corporation, USA), Brandon C. Marin (Intel Corporation, USA), Shuren Qu (Intel Corporation, USA), Siddharth Kulasekaran (Intel Corporation, USA), Jose I. Chavarria (Intel Corporation, USA), Leigh E. Wojewoda (Intel Corporation, USA), and Kaladhar Radhakrishnan (Intel Corporation, USA)

Integrated Design Ecosystem for Chiplets Heterogeneous Integration and Chip-to-Chip Interconnects in Advanced Packaging Technology 1048
Lihong Cao (Advanced Semiconductor Engineering, Inc., USA), Chen-Chao Wang (Advanced Semiconductor Engineering, Inc, Taiwan), Chih-Yi Huang (Advanced Semiconductor Engineering, Inc, Taiwan), and Hung-Chun Kuo (Advanced Semiconductor Engineering, Inc, Taiwan)

Thermal and Mechanical Simulations of 3D Packages with Custom High Bandwidth Memory (HBM) 1054
Kamalika Chatterjee (Samsung Semiconductor Inc., USA), Yan Li (Samsung Semiconductor Inc., USA), Hochan Chang (Samsung Semiconductor Inc., USA), Mohsen Damadam (Samsung Semiconductor Inc., USA), Pouya Asrar (Samsung Semiconductor Inc., USA), Jaechoon Kim (Samsung Electronics Co., Ltd., USA), Glen Jeong (Samsung Semiconductor Inc., USA), and Woopoung Kim (Samsung Semiconductor Inc., USA)

A Novel DC-DC Converter Module Using the Integrated Package Solution (iPaS) Substrate for Next Generation High Performance Computing (HPC) Applications 1060
Shuhei Yamada (Murata Manufacturing Co., Ltd, Japan), Nobuyoshi Adachi (Murata Manufacturing Co., Ltd, Japan), Kazuki Itoyama (Murata Manufacturing Co., Ltd, Japan), Keito Yonemori (Murata Electronics North America Inc, USA), Tatsuya Kitamura (Murata Manufacturing Co., Ltd, Japan), Koshi Himeda (Murata Manufacturing Co., Ltd, Japan), and Atsushi Yamamoto (Murata Manufacturing Co., Ltd, Japan)

Session 26: Chiplet Interconnect Design and Validation

Impact of Pitch Scaling on 3D Die-to-Die Interconnects 1064
Nicolas Pantano (imec, Belgium), Michele Stucchi (imec, Belgium), Geert Van der Plas (imec, Belgium), and Eric Beyne (imec, Belgium)

A 32 Gb/s Full Duplex Bi-Directional Transceiver with Crosstalk Cancellation for Chiplet Interconnections 1072
Jae-Woo Park (Sungkyunkwan University Suwon, Republic of Korea), Nicolas Pantano (IMEC, Belgium), Geert Van Der Plas (IMEC, Belgium), Eric Beyne (IMEC, Belgium), and Jung-Hoon Chun (Sungkyunkwan University Suwon, Republic of Korea)

Modeling and Analysis of Heterogeneously Integrated Chiplet-to-Chiplet Communication Link in 2.5D Advanced Packaging 1078
Haofeng Sun (University of Illinois Urbana-Champaign, USA), Bobi Shi (University of Illinois Urbana-Champaign, USA), Thong Nguyen (University of Illinois Urbana-Champaign, USA), and José E. Schutt-Ainé (University of Illinois Urbana-Champaign, USA)

Signal, Power and Thermal Co-Optimization Methodology for FPGA Advanced Package 1085
Wei Liu (Intel Corporation, USA), Guang Chen (Intel Corporation, USA), Brian Wang (Intel Corporation, USA), Jenny Xiaohong Jiang (Intel Corporation, USA), and Ed Milligan (Intel Corporation, USA)

An Advanced Packaging Figure of Merit (AP-FoM) for Benchmarking of Heterogeneous Integration Technologies 1093
Chuei-Tang Wang (Taiwan Semiconductor Manufacturing Company, Ltd. Taiwan, R.O.C.), Shu-An Shang (Taiwan Semiconductor Manufacturing Company, Ltd. Taiwan, R.O.C.), Yu-Ming Hsiao (Taiwan Semiconductor Manufacturing Company, Ltd. Taiwan, R.O.C.), Mirng-Ji Lii (Taiwan Semiconductor Manufacturing Company, Ltd. Taiwan, R.O.C.), Kam Heng Lee (Taiwan Semiconductor Manufacturing Company, Ltd. Taiwan, R.O.C.), and Jun He (Taiwan Semiconductor Manufacturing Company, Ltd.Taiwan, R.O.C.)

Signal Integrity Designs at Organic Interposer CoWoS-R for HBM3-9.2Gbps High Speed Interconnection of 2.5D-IC Chiplets Integration 1098
Sheng-Fan Yang (Global Unichip Corporation, Taiwan), Wei-Chiao Wang (Global Unichip Corporation, Taiwan), Yi-Tzeng Lin (Global Unichip Corporation, Taiwan), Chih-Chiang Hung (Global Unichip Corporation, Taiwan), Hao-Yu Tung (Global Unichip Corporation, Taiwan), and Justin Hsieh (Global Unichip Corporation, Taiwan)

Effective Interface Simulation Approach Based on Peak Distortion Analysis for UCIe IPs 1104
Joonhyun Kim (Foundry Business, Samsung Electronics, Co. Ltd, South Korea), Seungki Nam (Foundry Business, Samsung Electronics, Co. Ltd, South Korea), Sungwook Moon (Foundry Business, Samsung Electronics, Co. Ltd, South Korea), Taeyun Kim (Foundry Business, Samsung Electronics, Co. Ltd, South Korea), Sangin You (Foundry Business, Samsung Electronics, Co. Ltd, South Korea), Chanmin Jo (Foundry Business, Samsung Electronics, Co. Ltd, South Korea), and Yongho Lee (Foundry Business, Samsung Electronics, Co. Ltd, South Korea)

Session 27: Advanced Die Bond and Board Level Reliability

Impact of Chip-Package Parameters on the Thermomechanical Reliability of High Thermal Die Attach Materials in RF, Power, and Automotive Applications 1108
A R Nazmus Sakib (Renesas Electronics America, USA), Ruther Ricon (Renesas Electronics America, USA), Jake Eom (Renesas Electronics America, USA), Yoshitsugu Kawashima (Renesas Electronics America, USA), Kosuke Azuma (Renesas Electronics America, USA), Ganesh Tharumalingam (Renesas Electronics America, USA), and Young Kim (Renesas Electronics America, USA)

The Challenges of High-Temperature Lead-Free Solder Paste for Power Discrete Applications 1113
Hongwen Zhang (Indium Corporation, USA), Kyle Aserian (Indium Corporation, USA), David Hu (Indium Corporation, USA), Bo Chen (Alpha and Omega Semiconductor Ltd., USA), Tyler Richmond (Indium Corporation, USA), Leo Hu (Indium Corpoation, China P.R.), Kaiyuan Zhu (Alpha and Omega Semiconductor LTD, USA), and Mary Jane R. Alin (Alpha and Omega Semiconductor Ltd., USA)

Reliability Analysis of Cu Sintered Die-Attach for SiC Power Devices: Mechanical, Electrical and Thermal Evaluation 1119
Xu Liu (Delft University of Technology, The Netherlands), Shaogang Wang (Delft University of Technology, The Netherlands), Dong Hu (Delft University of Technology, The Netherlands), Chenshan Gao (Southern University of Science and Technology, China), Qianming Huang (Southern University of Science and Technology, China), Huaiyu Ye (Southern University of Science and Technology, China), Paddy French (Delft University of Technology, The Netherlands), and Guoqi Zhang (Delft University of Technology, The Netherlands)

Complex Board via Structure Induced Uneven Stress/strain Impact on Interconnect Stability: SAC305, Full and Hybrid LTS Comparison 1124
Tae-Kyu Lee (Cisco Systems, USA), Yujin Park (Cisco Systems, USA), Gnyaneshwar Ramakrishna (Cisco Systems, USA), Jonghyun Nam (SK Hynix, Korea), Daljin Yoon (SK Hynix, Korea), and Heera Roh (SK Hynix, Korea)

Mitigating Solder Beading in Non-Eutectic Low-Temperature Solder: Mechanism and Solution 1131
Lip Teng Saw (Western Digital), Mutharasu Devarajan (Western Digital), Puurnaraj Nadarajah (Western Digital), and Chye Yang Soo (Western Digital)

Enabling Socketable BGAs with Eutectic-Forming Bi-Based Coatings on Sn Spheres: A Closer Look at the Bi Deposition Process 1137
Jaewon Lee (Georgia Institute of Technology, USA) and Vanessa Smet (Georgia Institute of Technology, USA)

Develop new Solder Alloy for high Reliability Device 1144
Albert T Wu (National Central University, Taiwan), Watson Tseng (Shenmao Technology Inc., Taiwan), Chang-Meng Wang (Shenmao Technology Inc., Taiwan), and Wei-Ting Lin (National Central University, Taiwan)

Session 28: Optical Interconnections

Fiber Array Attach for co-Packaged Optics: High Volume Production Process Control and Performance 1148
Paul Gond-Charton (IBM Bromont, Canada), Sebastien Gouin (IBM bromont, Canada), Steve Pellerin (IBM bromont, Canada), Louis-Michel Collin (IBM Bromont, Canada), Michelle Sevigny (IBM Bromont, Canada), Patrick Jacques (IBM Bromont, Canada), and Elaine Cyr (IBM Bromont, Canada)

Photonic Building Blocks for Board-Level Disaggregation in Hyperscale Systems 1155
Richard Pitwon (Resolute Photonics, Ireland), Bernard H.L. Lee (SENKO Advanced Components, China), Abubakar Bhatti (Senko Advanced Components, UK), Michael O'Farrell (Senko Advanced Components, UK), Tatiana Berdinskih (Senko Advanced Components, Canada), Albert Wong (Senko Advanced Components, UK), James Lee (Wave Photonics, UK), and Jiangbo Zhu (Wave Photonics, UK)

Interfacing Silicon Photonics for CPO 1161
G. Van Steenberge (Imec; Ghent University, Belgium), J. Van Asch (Imec; Ghent University, Belgium), V. Geudens (Imec; Ghent University, Belgium), T. De Baere (Imec; Ghent University, Belgium), N. De Moerlooze (Imec; Ghent University, Belgium), J. Missinne (Imec; Ghent University, Belgium), A. Podpod (Imec, Belgium), G. Lepage (Imec, Belgium), N. Golshani (Imec, Belgium), R. Magdziak (Imec, Belgium), H. Sar (Imec, Belgium), S. Bipul (Imec, Belgium), D. Bode (Imec, Belgium), Y. Ban (Imec, Belgium), F. Ferraro (Imec, Belgium), and J. Van Campenhout (Imec, Belgium)

High Power Performance Assessment of Low-Loss Spot Size Converter Based on Self-Aligned Passive Fiber Attach Process 1166
Arpan Dasgupta (GlobalFoundries, USA), Jae Kyu Cho (GlobalFoundries, USA), Yusheng Bian (GlobalFoundries, USA), Takako Hirokawa (GlobalFoundries, USA), Zahidur Chowdhury (GlobalFoundries, USA), Jason Kim (GlobalFoundries, USA), Farid Barakat (GlobalFoundries, USA), John Garant (GlobalFoundries, USA), Yarong Lin (GlobalFoundries, USA), Thomas Houghton (GlobalFoundries, USA), Arman Najafi (GlobalFoundries, USA), Brian Popielarski (GlobalFoundries, USA), Ryan Sporer (GlobalFoundries, USA), Michelle Zhang (GlobalFoundries, USA), Shenghua Song (GlobalFoundries, USA), Helen Wong (GlobalFoundries, USA), Norman Robson (GlobalFoundries, USA), Ian Melville (GlobalFoundries, USA), and Ken Giewont (GlobalFoundries, USA)

A Compact, High Performance Passive Optical Network Transceiver Integration Approach 1170
Mark Earnshaw (Nokia Bell Labs), Cris Bolle (Nokia Bell Labs), Mark Cappuzzo (Nokia Bell Labs), and Rose Kopf (Nokia Bell Labs)

Characterization of 224 Gbps/lambda Interconnects in Co-packaged Optics for Hyperscale Data Centers and AI/ML Clusters 1175
*Jiaqi Wu (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR) , Singapore), Teck Guan Lim (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR) , Singapore), Sajay Bhuvanendran Nair Gourikutty (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Xin Li (Rain Tree Photonics Pte Ltd, Singapore), Jason Tsung-Yang Liow (Rain Tree Photonics Pte Ltd, Singapore), and Surya Bhattacharya (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore)*

Hybrid Integrated Chip-Scale Laser Systems Based on Automated Assembly 1179
Xiaolei Zhao (Clemson University, USA), Taylor LeVaur (Clemson University, USA), Lance Sweatt (Clemson University, USA), Siwei Zeng (Clemson University, USA), Md. Arefin Islam (Clemson University, USA), and Lin Zhu (Clemson University, USA)

Session 29: Reliability in Harsh Environments Including Automotive

Transitioning from Warpage "Control" to Warpage "Design": A Paradigm Shift 1187

Sukrut Prashant Phansalkar (University of Maryland, USA), Bongtae Han (University of Maryland, USA), and Gun Lee (Samsung Electronics, South Korea)

Under Bump Metallization and the Stability of Solder Interconnect Assembly Under Thermal and Electrical Load: Refreshed Understanding 1193

Hariram Mohanram (University of Texas at Arlington, USA), Choong-Un Kim (University of Texas at Arlington, USA), Qiao Chen (Texas Instruments Inc, USA), Patrick Thompson (Texas Instruments Inc, USA), and Sylvester Ankamah Kusi (Texas Instruments Inc, USA)

Additively Printed In-Mold Electronics Circuits and Sensors and Process-Performance Interactions for Automotive Applications 1198

Pradeep Lall (Auburn University), Ved Soni (Auburn University), Hyesoo Jang (Auburn University), Fatahi Musa (Auburn University), Md Golam Sarwar (Auburn University), and Scott Miller (NextFlex National Manufacturing Institute)

Enhancing Cu Wire-Bonding Reliability by a Cu-Selective Passivation Coating 1206

Dinesh Kumar Kumaravel (University of North Texas, USA), Kevin Antony Jesu Durai (University of North Texas, USA), Shyam M. Nair (University of North Texas, USA), Shinoj S. Nair (University of North Texas, USA), Hailey Huijun Yu (University of North Texas, USA), John Alptekin (University of North Texas, USA), Oliver Chyan (University of North Texas, USA), and Varughese Mathew (NXP Semiconductors, USA)

High Acceleration Dynamic Methodology for Board-Level Shock Solder Joint Reliability Approach 1213

Min-Cheng Yu (ASE Group, Taiwan), Nan-Yi Wu (ASE Group, Taiwan), Wu-Lung Wang (ASE Group, Taiwan), Hsin-Chih Shih (ASE Group, Taiwan), Wei-Hong Lai (ASE Group, Taiwan), Chin-Li Kao (ASE Group, Taiwan), Chen-Chao Wang (ASE Group, Taiwan), and Cp Hung (ASE Group, Taiwan)

Thermomechanical Degradation of Sintered Copper Under High-Temperature Thermal Shock 1219

Paul Paret (National Renewable Energy Laboratory, USA), Sri Krishna Bhogaraju (CuNex GmbH, Germany), Dirk Busse (Budatec GmbH, Germany), Alexander Dahlbüdding (Budatec GmbH, Germany), Gordon Elger (Technische Hochschule Ingolstadt, Germany), and Sreekant Narumanchi (National Renewable Energy Laboratory, USA)

Solder Reaction with Cu Alloy C7025 and Its Effect on Solder Joint Reliability 1225

Kejun Zeng (Texas Instruments Inc., USA), Venu Chauhan (Texas Instruments Inc., USA), and Lance Wright (Texas Instruments Inc., USA)

Session 30: Process and Hybrid Bonding Modeling and Characterization

Modeling of Copper Hybrid Bonding Anneal 1231
Joshua Hooge (Tokyo Electron America, Inc.), Chetan Jois (Purdue University), Christopher Netzband (TEL Technology Center America, LLC), and Ilseok Son (TEL Technology Center America, LLC)

Investigating Sintering Mechanism of 100 nm Ag Nanoparticles via In-Situ SEM Observation and Phase Field Simulation 1236
Xiao Hu (Delft University of Technology, The Netherlands), Dong Hu (Delft University of Technology, The Netherlands), René Poelma (Nexperia, The Netherlands), Jianlin Huang (Ampleon, The Netherlands), Jiajie Fan (Fudan University, China), Willem D. Van Driel (Delft University of Technology, The Netherlands), and Guoqi Zhang (Delft University of Technology, The Netherlands)

Elucidating the Mechanism of four Corner Voids in Chip-on-Wafer Hybrid Bonding 1241
Takaaki Hirano (Sony Semiconductor Solutions Corporations, Japan), Tatsumasa Hiratsuka (Sony Semiconductor Solutions Corporations, Japan), Hirotaka Yoshioka (Sony Semiconductor Solutions Corporations, Japan), Naoki Ogawa (Sony Semiconductor Solutions Corporations, Japan), Suguru Saito (Sony Semiconductor Solutions Corporations, Japan), Shoji Kobayashi (Sony Semiconductor Solutions Corporations, Japan), Yoshiya Hagimoto (Sony Semiconductor Solutions Corporations, Japan), and Hayato Iwamoto (Sony Semiconductor Solutions Corporations, Japan)

Fan-Out Embedded Bridge Structure for Co-packaged Optics Characterization and Evaluation 1246
Vito Lin (Siliconware Precision Industries Co. Ltd., Taiwan), Teny Shih (Siliconware Precision Industries Co. Ltd., Taiwan), Andrew Kang (Siliconware Precision Industries Co. Ltd., Taiwan), and Yu-Po Wang (Siliconware Precision Industries Co. Ltd., Taiwan)

Advanced Atomic-Scale Insights into the Chemical Mechanical Polishing Process with Ceria Abrasives Using Molecular Dynamics and Neural Network Potential 1251
Yoshishige Okuno (Resonac Corporation, Japan), Teruo Hirakawa (Resonac Corporation, Japan), Fukiko Ota (Resonac Corporation, Japan), Yuuto Kurata (Resonac Corporation, Japan), Akihiro Orita (Resonac Corporation, Japan), and Satoyuki Nomura (Resonac Corporation, Japan)

Finite Element Modeling for Wafer-to-Wafer Direct Bonding Behaviors and Alignment Prediction 1256
Kyungmin Baek (Mechatronics Research, Samsung Electronics, Korea), Min-soo Han (Mechatronics Research, Samsung Electronics, Korea), Il Young Han (Mechatronics Research, Samsung Electronics, Korea), Jung Shin Lee (Mechatronics Research, Samsung Electronics, Korea), Jaeuk Sim (Mechatronics Research, Samsung Electronics, Korea), Joongha Lee (Mechatronics Research, Samsung Electronics, Korea), Daeho Min (Mechatronics Research, Samsung Electronics, Korea), Kyeongbin Lim (Mechatronics Research, Samsung Electronics, Korea), and Minwoo Daniel Rhee (Mechatronics Research, Samsung Electronics, Korea)

Measurement of the Interfacial Strength of Thin Metal Film by Laser Spallation Method for Advanced Wafer Level Package 1260
Young-Min Ju (Hanyang University, South Korea), Hui-Jin Um (Hanyang Univeristy, South Korea), Se-Min Lee (Hanyang Univeristy, South Korea), Dukyong Kim (Hanyang Univeristy, South Korea), Woong-Kyoo Yoo (Hanyang Univeristy, South Korea), Daewoong Lee (SK hynix Inc., South Korea), Yeontaek Hwang (SK hynix Inc., South Korea), Seung Hwan Lee (Hanyang University, South Korea), and Hak-Sung Kim (Hanyang University, South Korea)

Session 31: Advances in Flip Chip and Chip Scale Packages

New Double Sided Molded Package Platform Development with Open Cavity Mold on One Side and Exposed Die Mold on the Other Side 1265
MiKyeong Choi Choi (Amkor Technology Korea, Korea), Julius Tsai Tsai (Qorvo, USA), GyeongCheol Lee Lee (Amkor Technology Korea, Korea), and KiDong Sim Sim (Amkor Technology Korea, Korea)

Package Miniaturization and Wiring Impedance Reduction for High-Bandwidth Memory Devices With Vertical Wire Bonding 1271
Keita Mochizuki (KIOXIA Corporation, Japan), Hiroyuki Wakioka (KIOXIA Corporation, Japan), Tsutomu Fujita (KIOXIA Corporation, Japan), Masatoshi Shomura (KIOXIA Corporation, Japan), Takeori Maeda (KIOXIA Corporation, Japan), Toshihiko Ohda (KIOXIA Corporation, Japan), Yoshitaka Muto (KIOXIA Corporation, Japan), Eiji Takano (KIOXIA Corporation, Japan), and Masahiro Inohara (KIOXIA Corporation, Japan)

Ultra-thin Double Side SiP Technology with Embedded Trace Substrate 1277
Che-Han Li (Renesas Electronics Corporation, Taiwan), Jesus Mennen Belonio (Renesas Electronics Corporation, Germany), Shih-Wen Tang (Renesas Electronics Corporation, Taiwan), and Yu-Shan Wei (Renesas Electronics Corporation, Taiwan)

High Accuracy Selective Patterning for EMI Shielding of 5G AiP 1282
Ming-Hung Chen (Advanced Semiconductor Engineering, Inc.), Huei-Pin Jian (Advanced Semiconductor Engineering, Inc.), Yi-Chun Chou (Advanced Semiconductor Engineering, Inc.), Yu-Shuan Tsai (Advanced Semiconductor Engineering, Inc.), Kuan-Lin Kuo (Advanced Semiconductor Engineering, Inc.), and Jen-Chieh Kao (Advanced Semiconductor Engineering, Inc.)

Analysis of Thin Flip Chip Chip-Scale Package Warpage Causes and Variations 1286
CS Foong (NXP Semiconductors Inc. Austin, Texas, USA), Amirul Afripin (NXP Malaysia Sdn. Bhd. Petaling Jaya, Selangor Malaysia), Nishant Lakhera (NXP Semiconductors Inc. Austin, Texas, USA), and Trent Uehling (NXP Semiconductors Inc. Austin, Texas, USA)

Large Package Body Size Scaling with Two Novel Technologies: Multi Ball BGA and Liquid Metal Interconnect 1293
Xiao Lu (Intel), Jiaqi Wu (Intel), Sangeon Lee (Intel), and Karumbu Meyyappan (Intel)

A Study About Direct Laser Reflow for Forming Stable and Reliable C4 Bump Interfaces on Semiconductor Substrates for Flip Chip Applications 1298
Matthias Fettke (PacTech GmbH), Anne Fisch (PacTech GmbH), Tom Geschke (PacTech GmbH), Alexander Frick (PacTech GmbH), Khaled Alyasin (PacTech GmbH), and Thorsten Teutsch (PacTech GmbH)

Session 32: Advancement in Copper Hybrid Bonding Technologies Common to Multiple Applications

A Microstructural Investigation of Sub-1 µm Copper Bonding Contact Structures in Die-to-Wafer Hybrid Bonding 1306
Sari Al Zerey (Binghamton University (State University of New York), USA), Junghyun Cho (Binghamton University (State University of New York), USA), Roy Yu (IBM Research, USA), and Katsuyuki Sakuma (IBM Research, USA)

Low-Temperature Cu-Cu Bonding Using <111>-Oriented and Nanocrystalline Hybrid Surface Grains 1312
Chen-Ning Li (National Yang Ming Chaio Tung University, Taiwan), Jia-Juen Ong (National Yang Ming Chiao Tung University, Taiwan), Wei-Lan Chiu (Industrial Technology Research Institute, Taiwan), Shih-Chi Yang (National Yang Ming Chiao Tung University, Taiwan), Hsiang-Hung Chang (Industrial Technology Research Institute, Taiwan), and Chih Chen (National Yang Ming Chiao Tung University, Taiwan)

In Situ Analysis of Copper Microstructures in Electromigration Using SEM-EBSD Techniques . 1317
Yaqian Zhang (Delft University of Technology, The Netherlands), Yixin Yan (Delft University of Technology, The Netherlands), Sten Vollebregt (Delft University of Technology, The Netherlands), and Guoqi Zhang (Delft University of Technology, The Netherlands)

Achieving Sub-nm Copper Recess Controllability for Advanced 3D Integration: An Experimental and Atomic-Scale Simulation Study on Wet Atomic Layer Etching Process 1322
Seung Ho Hahn (Mechatronics Research, Samsung Electronics, South Korea), Wooyoung Kim (Mechatronics Research, Samsung Electronics, South Korea), Kyeongbin Lim (Mechatronics Research, Samsung Electronics, South Korea), Bumki Moon (Mechatronics Research, Samsung Electronics, South Korea), and Minwoo Rhee (Mechatronics Research, Samsung Electronics, South Korea)

Quantifying the Electrical Impact of Bonding Misalignment for 0.5 µm Pitch Hybrid Bonding Structures 1329
Kevin Ryan (TEL Technology Center, America, LLC, USA), Nathan Ip (Tokyo Electron America, Inc., USA), Christopher Netzband (TEL Technology Center, America, LLC, USA), Kun-Chieh Chien (Tokyo Electron America, Inc., USA), Andrew Tuchman (TEL Technology Center, America, LLC, USA), Jason Huang (TEL Technology Center, America, LLC, USA), Scott LeFevre (TEL Technology Center, America, LLC, USA), Ilseok Son (TEL Technology Center, America, LLC, USA), Hirokazu Aizawa (TEL Technology Center, America, LLC, USA), and Kaoru Maekawa (TEL Technology Center, America, LLC, USA)

Liquid Surface Tension-Driven Chip Self-Assembly Technology with Cu-Cu Hybrid Bonding for High-Precision and High-Throughput 3D Stacking of DRAM 1335
Zehua Du (Tohoku University, Japan), Hiroshi Kikuchi (Yamaha Robotics Holdings Co., Ltd., Japan), Hayato Hishinuma (Yamaha Robotics Holdings Co., Ltd., Japan), Mariappan Murugesan (Tohoku University, Japan), Tetsu Tanaka (Tohoku University, Japan), and Takafumi Fukushima (Tohoku University, Japan)

Wafer-on-Wafer-on-Wafer (WoWoW) Integration Having Large-Scale High Reliability Fine 1 µm Pitch Face-to-Back(F2B) Cu-Cu Connections and Fine 6 µm Pitch TSVs 1342
Masaki Haneda (Sony Semiconductor Solutions Corporation, Japan), Yukako Ikegami (Sony Semiconductor Solutions Corporation, Japan), Kengo Kotoo (Sony Semiconductor Solutions Corporation, Japan), Kan Shimizu (Sony Semiconductor Solutions Corporation, Japan), Yoshihisa Kagawa (Sony Semiconductor Solutions Corporation, Japan), and Hayato Iwamoto (Sony Semiconductor Solutions Corporation, Japan)

Session 33: Fine-Pitch Materials and Processes

The Patterned Photosensitive Dielectric Organic Material/Cu Simultaneous Novel CMP Process for Fine Damascene RDL Based on Process Design Assisted by Deep Learning 1347
Toshiaki Tanaka (Osaka Metropolitan Univ., Japan), Hideaki Nishizawa (Doi Laboratory Inc., Japan), Mitsuru Ozono (Advanced Industrial Science and Technology, Kyushu, Japan), Seiji Takahashi (Lithotech Japan Corp., Japan), Masaaki Yasuda (Osaka Metropolitan Univ., Japan), Toshiro Doi (Doi Laboratory Inc., Japan), Hiroaki Kimuro (Advanced Industrial Science and Technology, Kyushu, Japan), Hisatoshi Hirai (Advanced Industrial Science and Technology, Kyushu, Japan), Yoichi Minami (Lithotech Japan Corp., Japan), Takeyasu Saito (Osaka Metropolytan Univ., Japan), Masaru Sasago (Osaka Metropolitan Univ., Japan), and Yoshihiko Hirai (Osaka Metropolitan Univ., Japan)

Novel Negative-Tone Dry Film Resist and Process for Fine Pitch Copper Wiring with L/S = 1.5/1.5 µm on Build-up Substrate 1354
Kei Togasaki (Resonac Corporation, Japan), Natsuki Toda (Resonac Corporation, Japan), Kensuke Yoshihara (Resonac Corporation, Japan), Yosuke Kaguchi (Resonac Corporation, Japan), Kanako Funai (Resonac Corporation, Japan), Hitoshi Onozeki (Resonac Corporation, Japan), and Kenichi Iwashita (Resonac Corporation, Japan)

Advanced Photo-imageable Dielectric Film Enabling Low CTE and sub-5µm Patterning for Next Generation Build-up Layer 1359
Taku Ogawa (JSR Corporation, Japan), Ryuichi Okuda (JSR Corporation, Japan), Fumie Kondo (JSR Corporation, Japan), and Hirokazu Ito (JSR Corporation, Japan)

Ultra High Density RDL Patterning of High–Resolution Dielectrics by Maskless Exposure Technology for High Performance Computing and Artificial Intelligence 1364
Ksenija Varga (EV Group, Austria), Thomas Uhrmann (EV Group, Austria), Roman Holly (EV Group, Austria), Tobias Zenger (EV Group, Austria), Boris Považay (EV Group, Austria), Dimitri Janssen (FUJIFILM Electronic Materials, Belgium), Niels van Herck (FUJIFILM Electronic Materials, Belgium), Mario Reybrouck (FUJIFILM Electronic Materials, Belgium), Marieke Vandevyvere (FUJIFILM Electronic Materials, Belgium), Sanjay Malik (FUJIFILM Electronic Materials, USA), and Stefan Vanclooster (FUJIFILM Electronic Materials, Belgium)

Novel Photo Imageable Film for RDL application 1370
Meiten Koh (Taiyo Ink MFG. Co., Ltd), Kazuyoshi Yoneda (Taiyo Ink MFG. Co. Ltd., Technology Development Division), Kazutaka Nakada (Taiyo Ink MFG. Co. Ltd., Technology Development Division), Yuna Kawata (Taiyo Ink MFG. Co. Ltd., Technology Development Division), Yusuke Naka (Taiyo Ink MFG. Co. Ltd., Technology Development Division), and Mitsuya Uchida (Taiyo Ink MFG. Co. Ltd., Technology Development Division)

Cu Nanowire Fine-Pitch Joints for Next Gen Heterogeneous Chiplet Integration 1376
Steffen Bickel (Fraunhofer Institute for Reliability and Microintegration IZM-ASSID, Germany), Sebastian Quednau (NanoWired GmbH, Germany), Olav Birlem (NanoWired GmbH, Germany), Juliana Panchenko (Fraunhofer Institute for Reliability and Microintegration IZM-ASSID and Technische Universität Dresden, Germany), and Manuela Junghähnel (Fraunhofer Institute for Reliability and Microintegration IZM-ASSID, Germany)

High-Planarity, Ultra-Low-Temperature-Curable Photosensitive Polyimide for Heterogeneous Integration 1382
Atsutaro Yoshizawa (Hitachi Site R&D Group, HD MicroSystems, Ltd., Japan), Akira Asada (Hitachi Site R&D Group, HD MicroSystems, Ltd., Japan), Daisaku Matsukawa (Hitachi Site R&D Group, HD MicroSystems, Ltd., Japan), and Takahiro Tanabe (Hitachi Site R&D Group, HD MicroSystems, Ltd., Japan)

Session 34: Photonics Integration, Materials, and Processes

Packaged Tunable Single Mode III-V Laser Hybrid Integrated on a Silicon Photonic Integrated Chip Using Photonic Wire Bonding 1387
Venkatesh Deenadayalan (Rochester Institute of Technology, USA), Eric Thornton (Rochester Institute of Technology, USA), George T. Nelson (The American Institute for Manufacturing Integrated Photonics (AIM Photonics), USA), Peter McGarvey (The American Institute for Manufacturing Integrated Photonics (AIM Photonics), USA), Jonathan D. King (The American Institute for Manufacturing Integrated Photonics (AIM Photonics), USA), Jill Patel (The American Institute for Manufacturing Integrated Photonics (AIM Photonics), USA), Justin Bickford (US Army Research Lab, USA), Matthew Mitchell (Dream Photonics, Canada), Lukas Chrostowski (Dream Photonics and University of British Columbia, Canada), Sudip Shekhar (University of British Columbia and Dream Photonics, USA), Juned N. Kemal (Vanguard Automation, Germany), Sebastian Tobias Skacel (Vanguard Automation, Germany), Mario Ciminelli (Rochester Institute of Technology, USA), and Stefan Preble (Rochester Institute of Technology, USA)

Collective die-to-Wafer Assembly Process for Optically Interconnected System-on-Wafer 1392
Koen Kennes (imec, Belgium), Anton Dvoretskii (imec, Belgium), Arnita Podpod (imec, Belgium), Pengfei Xu (imec, Belgium), Junwen He (imec, Belgium), Guy Lepage (imec, Belgium), Negin Golshani (imec, Belgium), Peter Verheyen (imec, Belgium), Rafal Magdziak (imec, Belgium), Swetanshu Bipul (imec, Belgium), Alain Phommahaxay (imec, Belgium), Maumita Chakrabarti (imec, Belgium), Andy Miller (imec, Belgium), Eric Beyne (imec, Belgium), Yoojin Ban (imec, Belgium), Filippo Ferraro (imec, Belgium), and Joris van Campenhout (imec, Belgium)

A Compact Wafer-Level Heterogeneously Integrated Scalable Optical Transceiver for Data Centers 1398
*Sajay Bhuvanendran Nair Gourikutty (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Jiaqi Wu (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Teck Guan Lim (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Sandra San (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Ming Chinq Jong (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Lai Yee Chia (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Boon Long Lau (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), David Soon Wee Ho (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Ser Choong Chong (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore), Ding Liang (Marvell Asia Pte Ltd, Singapore), Xiaoguang Tu (Marvell Asia Pte Ltd, Singapore), Wanjun Wang (Marvell Asia Pte Ltd, Singapore), Chee-Keong Tan (Marvell Asia Pte Ltd, Singapore), Alison See (Marvell Asia Pte Ltd, Singapore), Hsiu-Che Wang (Marvell Asia Pte Ltd, Singapore), Roberto Coccioli (Marvell Asia Pte Ltd, Singapore), Ronson Tan (Marvell Asia Pte Ltd, Singapore), Nagarajan Radhakrishnan (Marvell Asia Pte Ltd, Singapore), and Surya Bhattacharya (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore)*

Scalable Fabrication of 3D Optical Re-distribution for Co-Packaged Optics using an Developed Nanoimprint Stepper 1404
Fumi Nakamura (National Institute of Advanced Industrial Science and Technology (AIST)), Kenta Suzuki (National Institute of Advanced Industrial Science and Technology (AIST)), Akihiro Noriki (National Institute of Advanced Industrial Science and Technology (AIST)), Satoshi Suda (National Institute of Advanced Industrial Science and Technology (AIST)), Takayuki Kurosu (National Institute of Advanced Industrial Science and Technology (AIST)), and Takeru Amano (National Institute of Advanced Industrial Science and Technology (AIST))

Laser Attach Process Development and Material Selection 1409
Alexander Janta-Polczynski (IBM), Elaine Cyr (IBM), David Bolduc (IBM), Denis Blanchard (IBM), Eric Turcotte (IBM), Adrian Paz Ramos (IBM), Sebastien Gouin (IBM), Michelle Sevigny (IBM), Steve Whitehead (IBM), Jason Zheng (IBM), and Pascale Gagnon (IBM)

Ultra-Compact Computing at the Edge Involving Unobtrusively Small Sub-Millimeter Heterogeneous Integration Packaging 1416
Frank Libsch (IBM Research, USA), Steve Bedell (IBM Research, USA), Cyril Cabral (IBM Research, USA), Arun Paidiimarri (IBM Research, USA), Chitra Subramarian (IBM Research, USA), and Seiji Munetoh (IBM Research, Japan)

Sintering for High Power Optoelectronic Devices .... N/A
Nihesh Mohan (University of Applied Science Ingolstadt), Schwan Hannes (University of Applied Science Ingolstadt), Alberto Siligardi (University of Applied Science Ingolstadt,), Hamza Bin Aqeel (University of Applied Science Ingolstadt,), Rocky Kumar Saha (University of Applied Science Ingolstadt,), Fabian Steinberger (University of Applied Science Ingolstadt,), Klaus Müller (ams OSRAM Group Regensburg,), Holger Klassen (ams OSRAM Group Regensburg,), and Gordon Elger (University of Applied Science Ingolstadt,)

Session 35: Reliability and Current Stressing of Solder Interconnections

Electromigration in Eutectic Tin-Bismuth Bottom-Terminated-Component Solder Joints 1433
Prabjit Singh (IBM Corporation, USA), Larry Palmer (IBM Corporation, USA), Thomas Wassick (IBM Corporation, USA), Raiyo Aspandiar (Intel, USA), Brian Franco (Intel, USA), Haley Fu (iNEMI, China), Vasu Vasudevan (Dell Technologies, USA), Aileen Allen (HP Inc, USA), Keith Howell (Nihon Superior Company, Japan), Kei Murayama (Shinko Electric Industries, Japan), Hongwen Zhang (Indium Corporation, USA), Anna Lifton (MacDermid Alpha Electronics, USA), Terry Munson (Foresite, USA), Steve Middleton (Foresite, USA), Richard Coyle (Nokia, USA), and Sarangapani Murali (Heraeus Materials, Singapore)

Impact of Current Induced Joule Heating Variation on Long-Term Low Melting Temperature Solder Joint Stability 1439
Tae-Kyu Lee (Cisco Systems, USA), Yujin Park (Cisco Systems, USA), Gnyaneshwar Ramakrishna (Cisco Systems, USA), Pushkar Gothe (University of Texas, Arlington, USA), Young-Woo Lee (MK Electron, Korea), Hui-Joong Kim (MK Electron, Korea), Seul-Gi Lee (MK Electron, Korea), and Choong-Un Kim (University of Texas, Arlington, USA)

Reliability Concerns Due to Changes in the Microstructure and Electrical Resistance of Low Temperature, SnBi-Based Solder Joints During Current Stressing 1445
Sitaram Panta (Binghamton University, USA), Javier Flores (Binghamton University, USA), Silas Wieland (Binghamton University, USA), Babak Arfaei (Binghamton University, USA), and Eric Cotts (Binghamton University, USA)

The Effect of Extended Dwell Time on Thermal Cycling Performance of Hybrid Low Temperature Solder Joints 1452
Richard Coyle (Nokia Bell Labs, USA), Martin Anselm (RIT, USA), Chloe Feng (Nokia Bell Labs, USA), and Richard Popowich (Nokia Bell Labs, USA)

Correlation of Mechanical and Microstructural Evolutions in Lead Free Solders Subjected to Various Thermal Exposures 1460
Mohammad Al Ahsan (Auburn University, USA), S M Kamrul Hasan (Auburn University, USA), Souvik Chakraborty (Auburn University, USA), Jeffrey C. Suhling (Auburn University, USA), and Pradeep Lall (Auburn University, USA)

Pad Cratering and Pin Pull Strength for Large BGA and Connectors — How Are They Correlated? 1468
Dongji Xie (Nvidia Corporation, USA), Joe Hai (Nvidia Corporation, USA), Vivienne Zou (Nvidia Corporation, P.R. China), Zhongming Wu (Nvidia Corporation, P.R. China), and Minghong Jian (Nvidia Corporation, USA)

Board Level Drop Reliability of Hybrid Solder Joints with Controlled Bismuth Mixing Ratio for Carbon Neutrality 1473
Seahwan Kim (Sungkyunkwan University, Republic of Korea), Kyung Deuk Min (Samsung Electronics, Republic of Korea), Jae Jun Yoon (Sungkyunkwan University, Republic of Korea), Taejoon Noh (Sungkyunkwan University, Republic of Korea), and Seung-Boo Jung (Sungkyunkwan University, Republic of Korea)

Session 36: Thermal Management and Cooling Solutions

Electrical-Thermal Co-analysis of TSV Embedded Microfluidic Pin-fin Heatsink for High Power Dissipation with High Bandwidth Density 1479
Euichul Chung (Georgia Institute of Technology), Geyu Yan (Georgia Institute of Technology), Bharath Ramakrishnan (Microsoft CO+I), Husam Alissa (Microsoft CO+I), Vaidehi Oruganti (Microsoft CO+I), Christian Belady (Microsoft CO+I), Erik W. Masselink (Georgia Institute of Technology), and Muhannad S. Bakir (Georgia Institute of Technology)

Thermal Mitigation Strategy for Backside Power Delivery Network 1485
Feifan Xie (Purdue University, USA), Rongmei Chen (Peking University, China), and Tiwei Wei (Purdue University, USA)

Thermal Management of 6-in-1 SiC Power Module with Double-Sided Impingement Cooling 1493
*Yong Han (Institute of Microelectronics, A*STAR) and Gongyue Tang (Institute of Microelectronics, A*STAR)*

Thermal Performance of an Indium-Silver Alloy Metal TIM for a Large Body Lidded FCBGA After EOL and Long-term Reliability Tests 1498
SangHyuk Kim (Amkor Technology Koera, Inc.), EunSook Sohn (Amkor Technology Koera, Inc.), YoungDo Kweon (Amkor Technology, Inc.), and KyungRok Park (Amkor Technology Koera, Inc.)

AI-Driven Cold Plate Design and Optimization .... N/A
Yue Wu (Cadence Design Systems), Eric Chu (Cadence Design Systems), Shinyu Shiau (Cadence Design Systems), Nathan Ai (Cadence Design Systems), Albert Zeng (Cadence Design Systems), and Hoa Pham (Cadence Design Systems)

Heat Dissipation Measurement in Flip-Chip Package Using Microfabricated Temperature Sensors on Lid 1508
Arsène Guédon (Interdisciplinary Institute for Technological Innovation, Sherbrooke University, Canada), Nizar Bouguerra (Interdisciplinary Institute for Technological Innovation, Sherbrooke University, Canada), Étienne Paradis (Interdisciplinary Institute for Technological Innovation, Sherbrooke University, Canada), Éric Duchesne (IBM Ltd Canada), Stéphanie Allard (IBM Canada Ltd), Hélène Frémont (Laboratoire de l'intégration du Matériau au système, Université de Bordeaux, France), and Dominique Drouin (Interdisciplinary Institute for Technological Innovation Sherbrooke University, Canada)

Innovative Two-Phase Immersion Cooling Solutions for High-Power Advanced Packages 1515
Sumit Sharma (National Yang Ming Chiao Tung University, Taiwan), Aqbal Ahmed (National Yang Ming Chiao Tung University, Taiwan), ICheng Huang (Advanced Semiconductor Engineering (ASE) Inc., Taiwan), Ying-Xu Lu (Advanced Semiconductor Engineering (ASE) Inc., Taiwan), Hung-Hsien Huang (Advanced Semiconductor Engineering (ASE) Inc., Taiwan), Chen-Chao Wang (Advanced Semiconductor Engineering (ASE) Inc., Taiwan), Chih-Pin Hung (Advanced Semiconductor Engineering (ASE) Inc., Taiwan), and Chi-Chuan Wang (National Yang Ming Chiao Tung University, Taiwan)

Session 37: Interactive Presentations 1

Long-term Reliability Analysis of Crystal Oscillator under Immersion Cooling with Various Coolants 1522
Yangfan Zhong (Alibaba Inc, China), Dan Liu (Alibaba Inc, China), Fangzhi Wen (Alibaba Inc, China), Xiaopeng Li (Alibaba Inc, China), Honghao Cao (Alibaba Inc, China), Tina Bao (Intel Inc, USA), Kai Wang (Intel Inc, USA), and Kai Xiao (Intel Inc, USA)

Impact of Bi-Content on the High Strain Rate Properties of SnAgCu Solders Under Sustained High-Temperature Operation 1530
Pradeep Lall (Auburn University), Vishal Mehta (Auburn University), Mrinmoy Saha (Auburn University), Jeff Suhling (Auburn University), and David Locker (US Army CCDC-AvMC)

Bond-Line Thickness Prediction for Thermal Interface Material Under Usage Conditions 1538
Yangyang Lai (Binghamton University), Jiefeng Xu (Binghamton University), Jonghwan Ha (Binghamton University), Karthik A Deo (Binghamton University), Junbo Yang (Binghamton University), and Seungbae Park (Binghamton University)

Cu/Dielectric Hybrid Bonding Among Glass and Si 1543
*Hemanth Kumar Cheemalamarri (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR, Singapore), Arvind Sundaram (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Tran Anh Van Nhat (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Jae Ok Yoo (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Srinivasa Rao Vempati (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), and Navab Singh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore)*

Multiphysics Overlay Modelling of Monolithic 3D Fusion and Hybrid Bonding Processes 1548
Christian Mühlstätter (EV Group, Austria), Lukas Koller (EV Group, Austria), Thomas Plach (EV Group, Austria), Viorel Dragoi (EV Group, Austria), and Markus Wimplinger (EV Group, Austria)

Mitigating Cracking from RDL Stress in Glass Substrates with Low-CTE Electrodeposited Copper-Graphene Composites 1552
Christian Molina-Mangual (Georgia Institute of Technology, USA), Emanuel Torres Surillo (Georgia Institute of Technology, USA), Nithin Nedumthakady (Georgia Institute of Technology, USA), and Vanessa Smet (Georgia Institute of Technology, USA)

A Predictive Methodology for BGA Solder Joint Formation and Assembly Defects 1558
Matt Bond (Google, USA), Mudasir Ahmad (Google, USA), Sue Teng (Google, USA), Nima Shahidi (Google, USA), Jin Kim (Google, USA), and Yingshi Tang (Google, USA)

High-Performance Thermal and Electrical Characteristics of Via-Last (BBCube) Process in Multi-Layer 3D Integration 1564
Norio Chujo (Tokyo Institute of Technology, Japan; Hitachi, Ltd. Research & Development Gropup, Japan), Hiroyuki Ryoson (Tokyo Institute of Technology, Japan), Koji Sakui (Tokyo Institute of Technology, Japan), Shinji Sugatani (Tokyo Institute of Technology, Japan), Masao Taguchi (Tokyo Institute of Technology, Japan), and Takayuki Ohba (Tokyo Institute of Technology, Japan)

Embedded Liquid Cooling of High-Power Microelectronics Using Liquid Metal 1569
*Huicheng Feng (Institute of Microelectronics, A*STAR, Singapore, Singapore), Bin He (Institute of Microelectronics, A*STAR, Singapore), Gongyue Tang (Institute of Microelectronics, A*STAR, Singapore), Xiaowu Zhang (Institute of Microelectronics, A*STAR, Singapore), Boon Long Lau (Institute of Microelectronics, A*STAR, Singapore), Keng Yuen Jason Au (Institute of Microelectronics, A*STAR, Singapore), Jun Wei Javier Ong (Institute of Microelectronics, A*STAR, Singapore), and Ming Chinq Jong (Institute of Microelectronics, A*STAR, Singapore)*

A Development of Sensorized Ear Model for New Behind-the-ear (BTE) Hearing Aid 1575
*Ramona B. Damalerio (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Wei Da Toh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Rui Qi Lim (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), and Ming-Yuan Cheng (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore)*

Electrical Characterization and Reliability Studies of Nano-TSV 1581
*Ya-Ching Tseng (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), King-Jien Chui (n/a), Simon Chun Kiat Goh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Daniel Lau (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Hongyu Li (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Tran Van Nhat Anh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Haitao Yu (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Chin Khang Tew (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Gim Guan Chen (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Binni Varghese (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), and Calvin Chua Hung Ming (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore)*

A Simulation-Led Board Level Reliability Assessment of High Speed Printed Circuit Boards for Advanced Networking Applications .... N/A
Omar Ahmed (Juniper Networks, USA), Peng Su (Juniper Networks, USA), Leif Hutchinson (Juniper Networks, USA), Bernard Glasauer (Juniper Networks, USA), Vishnu Shukla (University of Central Florida, USA), Andrea Molina Moreno (University of Central Florida, USA), and Tengfei Jiang (University of Central Florida, USA)

Thermal Resistance Prediction Model for IC Packaging Optimization and Design Cycle Reduction 1593
Guan-Wei Chen (Institute of Innovative Semiconductor and Sustainable Manufacturing Nantinal Cheng - Kung University Tainan, Taiwan), Yan-Cheng Lin (Institute of Manufacturing Inforamtion and Systems Nantinal Cheng - Kung University Tainan, Taiwan), Chung-Hsiang Hsu (Department of Manufacturing Inforamtion and Systems Nantinal Cheng - Kung University Tainan, Taiwan), Tang-Yuan Chen (Group Corporate Research and Development Division Advanced Semiconductor Engineering Inc. Kaohsiung,Taiwan), Chen-Chao Wang (Corporate R&D Center Advanced Semiconductor Engineering Inc. Kaohsiung, Taiwan), Chin-Pin Hung (Advanced Semiconductor Engineering Inc. Kaohsiung, Taiwan), and Hung-Kai Wang (Department of Computer Science and Information Engineering Nantinal Cheng - Kung University Tainan, Taiwan)

Study of Stress and Warpage Estimate of FOWLP Under Hygro-Thermal Coupling Loading Condition 1599
Yu-Wei Huang (Electronic and Optoelectronics Research Laboratories, Industrial Technology Research Institute, Taiwan), Ruchi Ashok Kumar Yadav (National Tsing Hua University, Taiwan), Hong-Yu Lin (National Tsing Hua University, Taiwan), Chien-Han Lee (National Tsing Hua University, Taiwan), and Chang-Chun Lee (National Tsing Hua University, Taiwan)

Single and Multi NPU Chiplet Heterogeneous Integration Packaging Based on Fanout RDL Interposer with Silicon Bridge Technology 1603
Lewis Kang (nepes Corporation), Jay Kim (nepes Corporation), Bruce Lee (nepes Corporation), Jade Park (nepes Corporation), Han Ju Yu (nepes Corporation), Sung Hyuk Lee (nepes Corporation), Jacinta Aman Lim (nepes Corporation), Min Ji Lee (nepes Corporation), Seong Hwan Han (nepes Corporation), Jae Kyung Lee (nepes Corporation), and Hailey Hwang (nepes Corporation)

Thermal Transport Properties of Hybrid Bonding With Passivation 1609
Hakjun Kim (Seoul National University, Korea), Jae Young Hwang (Seoul National University, Korea), Sangwoo Park (Seoul National University of science and Technology, Korea), Sarah Eunkyung Kim (Seoul National University of science and Technology, Korea), Young-Chang Joo (Seoul National University, Korea), and Hyejin Jang (Seoul National University, Korea)

Optimization of Core Material Properties for Large Flip-Chip Ball Grid Array Substrate to Manage Both Warpage and Board Level Reliability 1613
Hirokazu Noma (Resonac Corporation, Japan), Masaki Takahashi (Resonac Corporation, Japan), Nene Hatakeyama (Resonac Corporation, Japan), Yuichi Yanaka (Resonac Corporation, Japan), Akito Fukui (Resonac Corporation, Japan), Keita Johno (Resonac Corporation, Japan), and Hitoshi Onozeki (Resonac Corporation, Japan)

Embedded Cooling Method with Monolithic Dual-Layer Microchannel Cold Plate for high-Power Chips 1619
Jianyu Du (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China), Hongxu Wu (China University of Geosciences (Beijing), China; Peking University, China), Huaiqiang Yu (26th Research Institute of China Electronics Technology Group Corporation, China), Chi Zhang (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China), and Wei Wang (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China; Beijing Advanced Innovation Center for Integrated Circuits, China)

Method to Evaluate the Adhesion Distribution on Wafers 1623
Tatsumasa Hiratsuka (Sony Semiconductor Solutions Corporation, Japan), Takaaki Hirano (Sony Semiconductor Solutions Corporation, Japan), Kengo Kotoo (Sony Semiconductor Solutions Corporation, Japan), Nobutoshi Fujii (Sony Semiconductor Solutions Corporation, Japan), Suguru Saito (Sony Semiconductor Solutions Corporation, Japan), Shoji Kobayashi (Sony Semiconductor Solutions Corporation, Japan), Yoshiya Hagimoto (Sony Semiconductor Solutions Corporation, Japan), and Hayato Iwamoto (Sony Semiconductor Solutions Corporation, Japan)

Experimental and Numerical Investigation of Cu-Cu Direct Bonding Quality for 3D Integration 1628
Sung-Hyun Oh (Sungkyunkwan University, Republic of Korea), Hyun-Dong Lee (Sungkyunkwan University, Republic of Korea), Jae-Uk Lee (Sungkyunkwan University, Republic of Korea), Sung-Ho Park (BASF Company Ltd., Republic of Korea), Won-Seob Cho (BASF Company Ltd., Republic of Korea), Yong-Jin Park (BASF Company Ltd., Republic of Korea), Alexandra Haag (BASF SE, Germany), Soichi Watanabe (BASF SE, Germany), Marco Arnold (BASF SE, Germany), Hoo-Jeong Lee (Sungkyunkwan University, Republic of Korea), and Eun-Ho Lee (Sungkyunkwan University, Republic of Korea)

Atomistic Simulation Investigation of Various Plasma Surface Activations in SiCN Dielectric Bonding 1633
Hojin Kim (TEL Technology Center, America, LLC, USA), Andrew Tuchman (TEL Technology Center, America, LLC, USA), Yu-Hao Tsai (TEL Techology Center, America, LLC, USA), Toru Hisamatsu (TEL Technology Center, America, LLC, USA), Ilseok Son (TEL Technology Center, America, LLC, USA), and Sitaram Arkalgud (TEL Technology Center, America, LLC, USA)

Reliability of Differently Shaped Solder Joints in Chip Resistor Under Drop Impact 1639
Jonghwan Ha (The State University of New York at Binghamton, USA), Karthik Arun Deo (The State University of New York at Binghamton, USA), Junbo Yang (The State University of New York at Binghamton, USA), Yangyang Lai (The State University of New York at Binghamton, USA), and Seungbae Park (The State University of New York at Binghamton, USA)

Study of Damage Development in Under-Bump Interconnects by Thermo-Mechanical Stress in Package Interconnects 1644
Jorge Mendoza (The University of Texas at Arlington, USA), Choong-Un Kim (The University of Texas at Arlington, USA), and Hung-Yun Lin (Texas Instruments, USA)

Aging Behaviour and Environmental Impact of Under Bump Metallurgies for Wafer Level Balling 1649
Arnaud Garnier (Univ. Grenoble Alpes, CEA, LETI, France), Laetitia Castagné (Univ. Grenoble Alpes, CEA, LETI, France), Stéphane Moreau (Univ. Grenoble Alpes, CEA, LETI, France), Alexandra Fraczkiewicz (Univ. Grenoble Alpes, CEA, LETI, France), Théo Monniez (Univ. Grenoble Alpes, CEA, LETI, France), Daniel Mermin (Univ. Grenoble Alpes, CEA, LETI, France), Suzanne Guillou (Univ. Grenoble Alpes, CEA, LETI, France), Laura Vauche (Univ. Grenoble Alpes, CEA, LETI, France), Damien Saint-Patrice (Univ. Grenoble Alpes, CEA, LETI, France), and Perceval Coudrain (Univ. Grenoble Alpes, CEA, LETI, France)

Automatic Solder Joint Failure Mode Analysis Based on Dye & Pry Image Processing 1657
Yinan Lu (Western Digital), Chaolun Zheng (Western Digital), Andrew Huang (Western Digital), Sean Lau (Western Digital), Ning Ye (Western Digital), and Bo Yang (Western Digital)

Session 38: Interactive Presentations 2

Conformal Dry Electrode for ECG Monitoring 1662
Riadh Al-Haidari (Binghamton University, USA), Babatunde Falola (Binghamton University, USA), Mohammed Alhendi (Binghamton University, USA), Mark J. Schadt (Binghamton University, USA), Mark Poliks (Binghamton University, USA), Daniel Balder (Sunray Scientific, USA), Andrew Stemmermann (Sunray Scientific, USA), Matthew Foster (Sunray Scientific, USA), Veerendra Balchand (Sunray Scientific, USA), Tzu-Jen Kao (GE HealthCare -Technology and Innovation Center, USA), and Nancy Stoffel (GE Research Center, USA)

Electrical Behavior of Thin Die Assembly on Flexible Substrate Under Vibration Testing 1670
Sara Lieberman (Binghamton University, USA), El Mehdi Abbara (Binghamton University, USA), Nathaniel Gee (Binghamton University, USA), K.U.S. Somarathna (Binghamton University, USA), Babatunde Falola (Binghamton University, USA), Abhishek Navkar (Binghamton University, USA), Abdullah Obeidat (Binghamton University, USA), Zhi Dou (Binghamton University, USA), Mohammed Alhendi (Binghamton University, USA), Peter Borgesen (Binghamton University, USA), Suresh Sitaraman (Georgia Institute of Technology, USA), and Mark Poliks (Binghamton University, USA)

Quantifying Uncertainties in the Correlation of Simulations and Measurements Using the IEEE EPS Packaging Benchmark Suite 1677
Jonatan Aronsson (CEMWorks Inc., Canada) and Kemal Aygun (Intel Corporation, AZ)

Polymer Waveguides for Co-packaged Optics 1683
Yi Shen (DuPont, USA), Michael Gallagher (DuPont, USA), Marika Immonen (TTM Technologies, Finland), Ross Johnson (DuPont, USA), Jake Joo (DuPont, USA), Masaki Kondoh (DuPont, Japan), Matthew Neely (TTM Technologies, USA), James Ryley (DuPont, USA), Everett Sarauer (TTM Technologies, USA), David Senk (TTM Technologies, USA), Rui Zhang (DuPont, USA), and Zhebin Zhang (DuPont, USA)

The Energy-Efficient 10-Chiplet AI Hyperscale NPU on Large-Scale Advanced Package 1687
Jiwon Yoon (Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea), Youngsu Kwon (Electronics and Telecommunications Research Institute (ETRI), Republic of Korea), Hyunwoo Kim (Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea), Juhyeon Lee (Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea), Joungho Kim (Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea), Sungjin Kim (Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea), Heejun Jang (Amkor Technology Korea, Republic of Korea), Kyun Ahn (Amkor Technology Korea, Republic of Korea), Jinhan Kim (amkor Technology Korea, Republic of Korea), Taekyeong Hwang (Amkor Technology Korea, Republic of Korea), Yi-gyeong Kim (Electronics and Telecommunications Research Institute (ETRI), Republic of Korea), and Minseok Choi (Electronics and Telecommunications Research Institute (ETRI), Republic of Korea)

Development of Robust and Cost-Effective Electrical & Optical Interconnect Solution for High Performance Silicon Photonic Applications 1694
Jae Kyu Cho (Globalfoundries Inc., USA), Takako Hirokawa (Globalfoundries Inc., USA), Yusheng Bian (Globalfoundries Inc., USA), Scott Pozder (Globalfoundries Inc., USA), Koushik Ramachandran (Globalfoundries Inc., USA), Farid Barakat (Globalfoundries Inc., USA), Arpan Dasgupta (Globalfoundries Inc., USA), Jason Kim (Globalfoundries Inc., USA), Zahidur Chowdhury (Globalfoundries Inc., USA), Norman Robson (Globalfoundries Inc., USA), Thomas Houghton (Globalfoundries Inc., USA), Michelle Zhang (Globalfoundries Inc., USA), Yarong Lin (Globalfoundries Inc., USA), Ryan Sporer (Globalfoundries Inc., USA), Seungman Choi (Globalfoundries Inc., USA), Hanyi Ding (Globalfoundries Inc., USA), Rongtao Cao (Globalfoundries Inc., USA), John Garant (Globalfoundries Inc., USA), Brian Popielarski (Globalfoundries Inc., USA), Ian Melville (Globalfoundries Inc., USA), and Ken Giewont (Globalfoundries Inc., USA)

Low-Loss Non-Contact Interconnects Based on 3D Heterogeneous Redistribution Layer for Millimeter Wave Phased Arrays .... N/A
Lichang Huang (South China University of Technology, China), Yuting Tong (Guangdong University of Technology, China), Xiaobin Xu (Glorysky Electronic Technology Co., Ltd., China), Jinxing Chen (Glorysky Electronic Technology Co., Ltd., China), Sha Xu (Guangdong University of Technology, China), and Yunfei Cao (South China University of Technology, China)

Thermal Performance and Reliability of Liquid Metal Alloys as Thermal Interface Materials for Computing Electronics Devices 1705
Guangyu Fan (Indium Corporation of America, USA), Jacob Wells (Indium Corporation of America, USA), and Michael Beam (SUNYPoly, Marcy, NY, USA)

Multi-wideband Antenna in Package with Dual Polarizations 1712
*Mei Sun (Institute of Microelectronics, A*STAR (Agency for Science, Technology and Research), Singapore)*

Deep Reinforcement Learning-Based Power Distribution Network Design Optimization for Multi-chiplet System 1716
*Weiyang Miao (Nanyang Technological University, Singapore), Zhen Xie (Nanyang Technological University, Singapore), Chuan Seng Tan (Nanyang Technological University, Singapore), and Mihai D. Rotaru (Institute of Microelectronics Agency for Science, Technology and Research (A*STAR), Singapore)*

Novel Low Loss Polymer with High Thermal Resistance for Advanced IC Packaging 1724
Hikaru Mizuno (JSR Micro, Inc., USA), Eri Mishima (JSR Corporation, Japan), Shunsuke Iizuka (JSR Corporation, Japan), Yuuichi Yashiro (JSR Corporation, Japan), and Naoyuki Kawashima (JSR Corporation, Japan)

Power Supply Design and Power Management in Complex System Design: Co-Packaged Optics-FPGA
3D SIP Module 1729
Jugal Kishore Bhandari (LightSpeed Photonics Pte. Ltd., India), Sandhya Dharavath (LightSpeed Photonics Pte. Ltd., India), Venkata V Ramana Pamidighantam (LightSpeed Photonics Pte. Ltd., Singapore), Rohin Kumar Yeluripati (LightSpeed Photonics Pte. Ltd., Singapore), Anusha Veerandi (LightSpeed Photonics Pte. Ltd., India), Ubed Mohammed (LightSpeed Photonics Pte. Ltd., India), and Vamsi Rekapalli (LightSpeed Photonics Pte. Ltd., India)

On-Package Additively Manufactured Chemiresistive Sensors for Smart Agriculture: Detection of Airborne Sex Pheromone of Domestic Silk Moths 1733
Yunnan Fang (Georgia Institute of Technology, USA), Genaro Soto-Valle (Georgia Institute of Technology, USA), Andrew D. Fang (George Walton Comprehensive High School, USA), Zihao Lin (Georgia Institute of Technology, USA), Ching-Ping Wong (Georgia Institute of Technology, USA), and Manos M. Tentzeris (Georgia Institute of Technology, USA)

All-Cu 3D Interconnects as an Alternative to Hybrid Bonding 1737
Tadatomo Suga (Meisei University, Japan) and Kanji Otsuka (Meisei University, Japan)

Additive Manufacturing of a mmWave Microstrip Leaky Wave Antenna on Thin Alumina Substrate 1742
Ethan Kepros (Michigan State University, USA), Yihang Chu (Michigan State University, USA), Bhargav Avireni (Michigan State University, USA), Sambit Kumar Ghosh (Michigan State University, USA), Brian Wright (Michigan State University, USA), and Premjeet Chahal (Michigan State University, USA)

Conductive Fabric Based RFID Wearable Textile Antennas for Product Authentication and Quality Control 1746
Bhargav Avireni (Michigan State University, USA), Yihang Chu (Michigan State University, USA), Ethan Kepros (Michigan State University, USA), Sambit Kumar Ghosh (Michigan State University, USA), and Premjeet Chahal (Michigan State University, USA)

Tire-Integrated Antennas for Wireless Sensors in Automotive Applications 1752
Yihang Chu (Michigan State University, USA), Bhargav Avireni (Michigan State University, USA), Sambit Kumar Ghosh (Michigan State University, USA), Ethan Kepros (Michigan State University, USA), and Premjeet Chahal (Michigan State University, USA)

Additively Manufactured Dissolvable Electronics Packaging for Sustainability 1759
Dhiya Belkadi (Purdue University, USA), Min Sung Kim (Purdue University, USA), Carl P Hahn (Purdue University, USA), Sunehra Saleha (Purdue University, USA), Hannah L. Houston (Purdue University, USA), and Muhammad Mustafa Hussain (Purdue University, USA)

Experimental Study of Transmission Signal Performance of sub-2 Micron fine-Wiring with Novel Structure 1763
Masaya Tanaka (Dai Nippon Printing co. Ltd., Japan), Nobuyoshi Moriwaki (Dai Nippon Printing co. Ltd., Japan), and Satoru Kuramochi (Dai Nippon Printing co. Ltd., Japan)

Comprehensive Socket Characterization and Correlation for High-Speed Interface Testing System 1768
Varin Sriboonlue (Qualcomm Technologies, Inc., USA), Yeseul Jeon (Qualcomm Technologies, Inc., USA), Gerardo R. Luevano (Qualcomm Technologies, Inc., USA), Chris Ferguson (Qualcomm Technologies, Inc., USA), and Ennai Ochoa (Qualcomm Technologies, Inc., USA)

A Novel Method for LPDDR5 DRAM Jitter Measurement Through De-embedding 1773
Manho Lee (Samsung Electronics, South Korea), Chulhee Cho (Samsung Electronics, South Korea), Hyeongi Lee (Samsung Electronics, South Korea), Sehoon Park (Samsung Electronics, South Korea), Wonseok Hong (Samsung Electronics, South Korea), ByungSuk Woo (Samsung Electronics, South Korea), Woo-Shin Choi (Samsung Electronics, South Korea), Young-Chul Cho (Samsung Electronics, South Korea), Young-Soo Sohn (Samsung Electronics, South Korea), and Jung-Hwan Choi (Samsung Electronics, South Korea)

An Effective Surface Roughness Extraction Method Using Particle Swarm Optimization (PSO) Algorithm and 2-D Based Equations for High Speed Systems 1777
Youngjae Lee (Samsung Electronics, South Korea), Kwangho Kim (Samsung Electronics, South Korea), Chulhee Cho (Samsung Electronics, South Korea), Sungjin Yoon (Samsung Electronics, South Korea), Hyeongi Lee (Samsung Electronics, South Korea), Wonji Hwang (Samsung Electronics, South Korea), Wooshin Choi (Samsung Electronics, South Korea), Young-Chul Cho (Samsung Electronics, South Korea), Jung-Hwan Choi (Samsung Electronics, South Korea), and Young-Soo Sohn (Samsung Electronics, South Korea)

Ultimate Wafer-level Lens Integration and Optimization for High-end Active Pixel Sensor Application 1784
Hoi-Jin Lee (Samsung, South Korea), Sihun Han (Samsung, South Korea), Chanyeol Park (Samsung, South Korea), Sunyong Park (Samsung, South Korea), Woonphil Yang (Samsung, South Korea), Jonghoon Park (Samsung, South Korea), Yunki Lee (Samsung, South Korea), Bumsuk Kim (Samsung, South Korea), Yitae Kim (Samsung, South Korea), and Jesuk Lee (Samsung, South Korea)

Microprinting Process Development Enabling Cost Effective, High Density and Flexible Electro-Optical Integration 1790
Krzysztof Nieweglowski (Technische Universität Dresden, Germany), David Weyers (Technische Universität Dresden, Germany), Akash Mistry (Technische Universität Dresden, Germany), and Karlheinz Bock (Technische Universität Dresden, Germany)

An Active, High Bandwidth, Flexible Connector for Large Area Computational Systems 1797
Randall Irwin (UCLA Center for Heterogeneous Integration and Performance Scaling, USA), Joanna Fang (UCLA Center for Heterogeneous Integration and Performance Scaling, USA), and Subramanian Iyer (UCLA Center for Heterogeneous Integration and Performance Scaling, USA)

Session 39: Interactive Presentations 3

A Novel Detection Applied on Micro Defect in Bump Interface for 2.5DIC Package 1804
Yi-Sheng Lin (Advanced Semiconductor Engineering, Group, Inc., Taiwan), Yu-Hsiang Hsiao (Advanced Semiconductor Engineering, Group, Inc., Taiwan), Cheng-Hsin Liu (Advanced Semiconductor Engineering, Group, Inc., Taiwan), Fan-Ju Hsiao (Advanced Semiconductor Engineering, Group, Inc., Taiwan), Chen-Chao Wang (Advanced Semiconductor Engineering, Group, Inc., Taiwan), and Chin-Pin Hung (Advanced Semiconductor Engineering, Group, Inc., Taiwan)

Hybrid Bonding Technology Chemical Mechanical Planarization Process Optimization Using Comprehensive 3D Modeling 1808
L. Jiang (Applied Materials Inc., USA), E. M. Bazizi (Applied Materials Inc., USA), G. Costrini (Applied Materials Inc., USA), P. Lianto (Applied Materials Inc., Singapore), G. See (Applied Materials Inc., Singapore), D. Tsamados (Synopsys Inc., Switzerland), Y. Saad (Synopsys Inc., Switzerland), S. Dag (Applied Materials Inc., US), G. Mehta (Applied Materials Inc., Singapore), Y.C. Yang (Applied Materials Inc., US), A. Sundarrajan (Applied Materials Inc., Singapore), and Subi Kengeri (Applied Materials Inc., US)

Influence of Stiffener Design on Co-Packaged Optics (CPO) 2.5D Heterogeneous Packages ... 1814
Karthik Arun Deo (SUNY Binghamton, USA), Yangyang Lai (SUNY Binghamton, USA), Junbo Yang (SUNY Binghamton, USA), Jong Hwan Ha (SUNY Binghamton, USA), and Seungbae Park (SUNY Binghamton, USA)

Adhesion Layer Influence on Thermomechanical Reliability of Electroplated Copper Through-Glass Via (TGV) 1820
Junbo Yang (The State University of New York at Binghamton, USA), Ke Pan (The State University of New York at Binghamton, USA), Pengcheng Yin (The State University of New York at Binghamton, USA), Yangyang Lai (The State University of New York at Binghamton, USA), Seungbae Park (The State University of New York at Binghamton, USA), Chukwudi Okoro (Corning Research & Development Corporation, USA), Dhananjay Joshi (Manufacturing Technology and Engineering, Corning Inc., USA), and Scott Pollard (Corning Research & Development Corporation, USA)

A Study on the Surface Activation of Plasma Treatment for Hybrid Bonding Joint Interface 1826
Chih-Jing Hsu (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Hsu-Nan Fang (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Tzu-Yu Su (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Zhao-Ze Jiang (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Yi-Hua Chen (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Chien-Ching Chen (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Che-Ming Hsu (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Yu-Pin Tsai (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Yuan-Feng Chiang (Advanced Semiconductor Engineering (ASE) Group, Taiwan), Jen-Chieh Kao (Advanced Semiconductor Engineering (ASE) Group, Taiwan), and Yung-I Yeh (Advanced Semiconductor Engineering (ASE) Group, Taiwan)

Influence of Heat Treatment on the Quality of Die-to-Wafer Hybrid Bond Interconnects 1830
Laura Wenzel (Fraunhofer IZM-ASSID, Germany; Technische Universität Dresden, Germany), Catharina Rudolph (Fraunhofer IZM-ASSID, Germany), Adil Shehzad (Fraunhofer IZM-ASSID, Germany), Partha Mukhopadhyay (Tokyo Electron Technology Center America, USA), H. Jim Fulford (Tokyo Electron Technology Center America, USA), Manuela Junghaehnel (Fraunhofer IZM-ASSID, Germany), and Juliana Panchenko (Fraunhofer IZM-ASSID, Germany; Technische Universität Dresden, Germany)

Inverse Hybrid Bonding with Metal Oxide Framework as Infill for Heterogeneous Integration 1837
Rohan Sahay (Georgia Institute of Technology, USA), Dipayan Pal (UC San Diego, USA), Ashita Victor (Georgia Institute of Technology, USA), Cheng-Hsuan Kuo (UC San Diego, USA), Madison Manley (Georgia Institute of Technology, USA), Harsono Simka (Samsung Semiconductor Inc., USA), Andy Kummel (UC San Diego, USA), and Muhannad Bakir (Georgia Institute of Technology, USA)

A Study of Chip-Package Interaction with All-Copper Interconnections on Advanced Glass Substrates 1841
Ramón A. Sosa (Georgia Institue of Technology, USA), Emanuel Torres Surillo (Georgia Institue of Technology, USA), Christian Molina-Mangual (Georgia Institue of Technology, USA), and Vanessa Smet (Georgia Institue of Technology, USA)

Electromigration Kinetics of SAC/SnBiAg Hybrid Solder 1848
Minhua Lu (IBM T.J. Watson Research Center, USA) and Evan Colgan (IBM T.J. Watson Research Center, USA)

Simulation of Bulge-Out Mechanism Enabling Sub-0.5 µm Scaling of Hybrid Wafer-to-Wafer Bonding 1853
Jo De Messemaeker (imec, Belgium), Koen Van Sever (imec, Belgium), Yan Wen Tsau (imec, Belgium), Boyao Zhang (imec, Belgium), Kristof Croes (imec, Belgium), and Eric Beyne (imec, Belgium)

Wet Cu Passivation for High Throughput Fluxless Thermal Compression Bonding of Cu-Sn µbumps for Die-to-Wafer Stacking 1859
Jens Rip (imec, Belgium), Jaber Derakhshandeh (imec, Belgium), Ryo Negishi (MEC Co, Ltd, Japan), Itsuro Tomatsu (MEC Co. Ltd, Japan), Dieter H. Cuypers (imec, Belgium), and Eric Beyne (imec, Belgium)

Low-Temperature Nanocrystalline Cu/polymer Hybrid Bonding with Tailored CMP Process .. 1863
Ou-Hsiang Lee (Industrial Technology Research Institute (ITRI), Taiwan), Wei-Lan Chiu (Industrial Technology Research Institute (ITRI), Taiwan), Hsiang-Hung Chang (Industrial Technology Research Institute (ITRI), Taiwan), Chia-Wen Chiang (Industrial Technology Research Institute (ITRI), Taiwan), Shih-cheng Yu (Industrial Technology Research Institute (ITRI), Taiwan), Tsung-Yu Ou Yang (Industrial Technology Research Institute (ITRI), Taiwan), Su-Ching Hsiao (Industrial Technology Research Institute (ITRI), Taiwan), Ting-Yu Ko (Industrial Technology Research Institute (ITRI), Taiwan), Yu-Min Lin (Industrial Technology Research Institute (ITRI), Taiwan), Chin-Hung Wang (Industrial Technology Research Institute (ITRI), Taiwan), Wei-Chung Lo (Industrial Technology Research Institute (ITRI), Taiwan), Chia-Hsin Lee (Brewer Science Taiwan/Brewer Science, Inc., Taiwan), Chung-An Tan (Brewer Science Taiwan/Brewer Science, Inc., Taiwan), Michelle Fowler (Brewer Science Taiwan/Brewer Science, Inc., Taiwan), and Maycie Lubbers (Brewer Science Taiwan/Brewer Science, Inc., Taiwan)

A Novel FOPLP Structure With Chip First & RDL First Process for Automotive Chip Application 1868
Terry Wang (Electonic and OptoelectronicSystem Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan), Chih Wei Lu (Electonic and OptoelectronicSystem Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan), Eric Feng (Electonic and OptoelectronicSystem Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan), Yu-Jhen Yang (Electonic and OptoelectronicSystem Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan), Cheng-Yueh Chang (Electonic and OptoelectronicSystem Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan), Pei-Pei Cheng (Electonic and OptoelectronicSystem Research Laboratories (EOSL), Industrial Technology Research Institute (ITRI), Taiwan), Fredrick Lie (Digital Lithography Group (DLG), Applied Materials Inc., USA), Austin Cheng (FAVITE Inc., Taiwan), Hsin-Yi Huang (Everlight Chemical Industrial Corp., Taiwan), Meiten Koh (TAIYO INK MFG. CO., LTD, Japan), Aneta Wiatrowska (XTPL S.A., Poland), and Łukasz Witczak (XTPL S.A., Poland)

A Unified and Adaptive Continual Learning Method for Feature Segmentation of Buried Packages in 3D XRM Images 1872
*Richard Chang (Institute for Infocomm Research (I2R), A*STAR, Singapore), Jie Wang (Institute for Infocomm Research (I2R), A*STAR, Singapore), Namrata Thakur (Institute for Infocomm Research (I2R), A*STAR, Singapore), Ziyuan Zhao (Institute for Infocomm Research (I2R), A*STAR, Singapore), Ramanpreet Singh Pahwa (Institute for Infocomm Research (I2R), A*STAR, Singapore), and Xulei Yang (Institute for Infocomm Research (I2R), A*STAR, Singapore)*

Low Thermal Budget Fine-Pitch Cu/Dielectric Hybrid Bonding with Cu Microstructure Modifications 1880
*Hemanth Kumar Cheemalamarri (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR); Fusionopolis Way, Republic of Singapore), Anh Tran Van Nhat (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR); Fusionopolis Way, Republic of Singapore), Gim Guan Chen (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR); Fusionopolis Way, Republic of Singapore), Meng Keong Lim (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR); Fusionopolis Way, Republic of Singapore), Srinivasa Rao Vempati (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR); Fusionopolis Way, Republic of Singapore), and Navab Singh (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR); Fusionopolis Way, Republic of Singapore)*

Fundamental Study on Reflow Mechanisms of Sn and Sn Alloys for Fine Bump Pitch Scaling . 1885
Chongyang Cai (Intel Corporation, USA), Anup Panindre (Intel Corporation, USA), Liang He (Intel Corporation, USA), Jung Kyu Han (Intel Corporation, USA), Gang Duan (Intel Corporation, USA), and Rahul Manepalli (Intel Corporation, USA)

20 µm Pitch Cu-to-Cu Flip-Chip Interconnects Through Cu Nanoparticles Sintering 1891
Xinrui Ji (Delft University of Technology, The Netherlands), Leiming Du (Delft University of Technology, The Netherlands), Henk Van Zeijl (Delft University of Technology, The Netherlands), Guoqi Zhang (Delft University of Technology, The Netherlands), Jaber Derakhshandeh (IMEC, Belgium), and Eric Beyne (IMEC, Belgium)

Glass Panel Process Integrated Low Stress Organic Dielectric RDL Structure 1896
Chien-Kang Hsiung (Applied Material Inc/National Yang Ming Chiao Tung University (NYCU), Taiwan), Terry Wang (Industrial Technology Research Institute (ITRI), Taiwan), Sarah Wozny (Applied Material Inc, USA), Marvin L Bernt (Applied Material Inc, USA), and Kuan-Nang Chen (National Yang Ming Chiao Tung University (NYCU), Taiwan)

A Warpage Investigation for a Large Panel-Sized Interposer with Embedded Dies 1900
Katsuaki To (Resonac Corporation, Japan), Masashi Minami (Resonac Corporation, Japan), Daisuke Yamanaka (Resonac Corporation, Japan), Shan Ho Tsai (Resonac Corporation, Japan), Takahiro Iseki (Resonac Corporation, Japan), and Sadaaki Katoh (Resonac Corporation, Japan)

Development of Two Different Molding Methods in 2.5D Package with 20 µm or Less Fine Bump Pitch CoW Structure 1905
Takeshi Saito (Resonac Corporation, Japan), Keiko Ueno (Resonac Corporation, Japan), Dongchul Kang (Resonac Corporation, Japan), Takahiro Iseki (Resonac Corporation, Japan), Shan Ho Tasi (Resonac Corporation, Japan), and Sadaaki Katoh (Resonac Corporation, Japan)

Low Temperature Cu/SiO2 Hybrid Bonding with Protruding Copper Pads 1911
Jun-Peng Fang (Tsinghua University, China), Qian Wang (Tsinghua University, China), Jie-Xun Yu (Tsinghua University, China), Zi-Qing Wang (Tsinghua University, China), Yi-Kang Zhou (Semiconductor Technology Innovation Center (Beijing) Corporation, China), Kai Zheng (Semiconductor Technology Innovation Center (Beijing) Corporation, China), and Jian Cai (Tsinghua University, China)

Analysis of Vacancies in Wafer-Bonding Interface via Positron Annihilation Lifetime Spectroscopy 1916
Sotetsu Saito (Sony Semiconductor Solutions Corporation, Japan), Nobutoshi Fujii (Sony Semiconductor Solutions Corporation, Japan), Shunsuke Furuse (Sony Semiconductor Solutions Corporation, Japan), Naoki Ogawa (Sony Semiconductor Solutions Corporation, Japan), Suguru Saito (Sony Semiconductor Solutions Corporation, Japan), Yoshiya Hagimoto (Sony Semiconductor Solutions Corporation, Japan), and Hayato Iwamoto (Sony Semiconductor Solutions Corporation, Japan)

Annealing Effects in Sub-8 µm Pitch Die-to-Wafer Hybrid Bonding 1923
Partha Mukhopadhyay (TEL Technology Center, America, LLC, USA), Laura Wenzel (Fraunhofer IZM ASSID, Germany), Catharina Rudolph (Fraunhofer IZM ASSID, Germany), Andrew Tuchman (TEL Technology Center, America, LLC, USA), Kevin Rayan (TEL Technology Center, America, LLC, USA), Adam Gildea (TEL Technology Center, America, LLC, USA), Chris Nichols (Skywater Technology, USA), John Allgair (BRIDG, USA), Sitaram Arkalgud (TEL Technology Center, America, LLC, USA), Anton deVilliers (TEL Technology Center, America, LLC, USA), and Jim Fulford (TEL Technology Center, America, LLC, USA)

Through Dielectric via Etching in Magnetic Neutral Loop Discharge Plasma for 3D Chiplets Interconnect 1929
Yasuhiro Morikawa (ULVAC, Inc., Japan) and Wei Chen (ULVAC Tecnologies, Inc., USA)

A Novel Plasma Etching Technology of RIE-Lag Free TSV and Dicing Processes for 3D Chiplets Interconnect 1934
Taichi Suzuki (ULVAC, Inc., Japan), Kenta Doi (ULVAC, Inc., Japan), Toshiyuki Nakamura (ULVAC, Inc., Japan), and Yasuhiro Morikawa (ULVAC, Inc., Japan)

Aluminum to Copper Thermal Compression Bonding for Heterogeneous Integration of Legacy Dielets 1940
Krutikesh Sahoo (University of California, Los Angeles), Vineeth Harish (University of California, Los Angeles), Jui-Han Liu (University of California, Los Angeles), Randall Irwin (University of California, Los Angeles), Cheng-Ting Michael Yang (University of California, Los Angeles), Henry Sun (University of California, Los Angeles), and Subramanian S. Iyer (University of California, Los Angeles)

Directional Atmospheric Plasma De-oxidation for Ultra Small Passive Component Assembly . 1947
Khouloud Ben Harzallah (University of Sherbrooke, Canada), David Danovitch (University of Sherbrooke, Canada), Malak Kanso (University of Sherbrooke, Canada), Christian Bergeron (IBM Systems, Canada), and Mark-Olivier Pion (IBM Systems, Canada)

Exploring Bonding Mechanism of SiCN for Hybrid Bonding 1953
Sodai Ebiko (Yokohama National University), Serena Iacovo (imec), Soon-Aik Chew (imec), Boyao Zhang (imec), Akira Uedono (University of Tsukuba), and Fumihiro Inoue (Yokohama National University)

Session 40: Interactive Presentations 4

Characterization of Warpage of Ultra-Low-K Dielectric Materials and Correlation with Modulus and Coefficient of Thermal Expansion 1958
Mohanalingam Kathaperumal (3D Systems Packaging Research Center, Georgia Institute of Technology, USA), Pragna Bhaskar (3D Systems Packaging Research Center, Georgia Institute of Technology, USA), Austin J. Toro (3D Systems Packaging Research Center, Georgia Institute of Technology, USA), Pratik Nimbalkar (3D Systems Packaging Research Center, Georgia Institute of Technology, USA), Lila Dahal (3D Systems Packaging Research Center, Georgia Institute of Technology, USA), and Muhannad S. Bakir (3D Systems Packaging Research Center, Georgia Institute of Technology, USA)

A Highly-Reliable and Cost-Effective Approach by Reducing Flux Cleaning in Flip-Chip Processes Through Underfill Curing in a Pneumatic Ambient 1963
Huan-Ping Su (Ableprint Technology Co., Ltd., Taiwan), Ming-Hua Hsu (Ableprint Technology Co., Ltd., Taiwan), and Chih-Horng Horng (Ableprint Technology Co., Ltd., Taiwan)

300 nm Pitch W2W HBI for CFET and 3D DRAM Through Module Co-optimization 1968
Tyler Sherwood (Applied Materials, USA), Raghav Sreenivasan (Applied Materials, USA), Dylan McIntyre (Applied Materials, USA), Taketo Sekine (Applied Materials, USA), Raghuveer Patlolla (Applied Materials, USA), Yoocharn Jeon (Applied Materials, USA), Ryan Ley (Applied Materials, USA), Gernot Probst (EV Group, Austria), Jason Appell (Applied Materials, USA), Amit Prakash (Applied Materials, USA), Masha Gorchichko (Applied Materials, USA), and Barbara Weis (EV Group, Austria)

Mechanical Characterization and Modeling of iSAC Lead-Free Solder 1973
Golam Rakib Mazumder (Auburn University, USA), Souvik Chakraborty (Auburn University, USA), Mahbub Alam Maruf (Auburn University, USA), Mohammad Al Ahsan (Auburn University, USA), Jeffrey C. Suhling (Auburn University, USA), and Pradeep Lall (Auburn University, USA)

Novel SiO2 Cables with Edge Launch Connectors for High Temperature RF Measurements ... 1981
Firas Alshatnawi (State University of New York at Binghamton, USA), Ashraf Umar (State University of New York at Binghamton, USA), Emuobosan Enakerakpo (State University of New York at Binghamton, USA), Mohamed Youssef Abdelatty (State University of New York at Binghamton, USA), Wt Alshaibani (State University of New York at Binghamton, USA), Riadh Al-Haidari (State University of New York at Binghamton, USA), Mohammed Alhendi (State University of New York at Binghamton, USA), David Shaddock (General Electric Aerospace Research, USA), Peter Borgesen (State University of New York at Binghamton, USA), and Mark Poliks (State University of New York at Binghamton, USA)

Modeling and Additive Manufacturing of Inductors in Complex Geometries for High Temperature Electronics 1986
Wt Alshaibani (State University of New York at Binghamton, USA), Ashraf Umar (State University of New York at Binghamton, USA), Firas Alshatnawi (State University of New York at Binghamton, USA), Emuobosan Enakerakpo (State University of New York at Binghamton, USA), Mohamed Youssef Abdelatty (State University of New York at Binghamton, USA), David Shaddock (General Electric Aerospace Research, USA), Mohammed Alhendi (State University of New York at Binghamton, USA), Cathleen Hoel (General Electric Aerospace Research, USA), and Mark D. Poliks (State University of New York at Binghamton, USA)

Underfill Selection Guideline for Fan-Out Heterogeneous Integration Package 1993
Wen-Yu Teng (Siliconware Precision Industries Co., Ltd, Taiwan), Liang-Yih Hung (Siliconware Precision Industries Co., Ltd, Taiwan), Jackson Lee (Siliconware Precision Industries Co., Ltd, Taiwan), Debby Li (Siliconware Precision Industries Co., Ltd, Taiwan), Carl Chen (Siliconware Precision Industries Co., Ltd, Taiwan), Don-Son Jiang (Siliconware Precision Industries Co., Ltd, Taiwan), and Yu-Po Wang (Siliconware Precision Industries Co., Ltd, Taiwan)

Comparison of Organic and Inorganic Dielectric Hybrid Bonding with Highly <111>-Oriented Nanotwinned Cu 1998
Pin-Syuan He (National Yang Ming Chiao Tung University, Taiwan) and Chih Chen (National Yang Ming Chiao Tung University, Taiwan)

One-Step Surface Modification for Boron Nitride and Its Polymer Composite of Enhanced Thermal Conductivity for Advanced Packaging Applications 2003
Zihao Lin (Georgia Institute of Technology, USA), Jiaxiong Li (Georgia Institute of Technology, USA), Zhijian Sun (Georgia Institute of Technology, USA), Andrew D. Fang (Walton High School, USA), Kyoung-Sik Moon (Georgia Institute of Technology, USA), and Ching-Ping Wong (Georgia Institute of Technology, USA)

Investigation on the use of Al-Ge Eutectic Bonding in the Structure Part of a Multilayer Stacked MEMS Device 2008
Jun Wang (Imec, Belgium), Manuel Mannarino (Imec, Belgium), Jakob Visker (Imec, Belgium), Shuo Kang (Imec, Belgium), Günther Weidlinger (EVG, Austria), Tobias Wernicke (EVG, Austria), Jürgen Burggraf (EVG, Austria), Markus Wimplinger (EVG, Austria), Bivragh Majeed (Imec, Belgium), Lan Peng (Imec, Belgium), Gauri Karve (Imec, Belgium), and Luc Haspeslagh (Imec, Belgium)

Limits for Dicing Speed Based on Crack Stop Constructions with Different Levels of Robustness 2013
Maria Heidenblut (Infineon Technologies AG, Germany), Michael Goroll (Infineon Technologies AG, Germany), Stefan Kaiser (Infineon Technologies AG, Germany), Andreas Bauer (Infineon Technologies AG, Germany), and Kristina Hopfauf (Infineon Technologies AG, Germany)

Vertical Stacking of Heterogeneous Chiplets of Duplexer on LNA/SOI 2017

*Tai Chong Chai (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Mihai Rotaru (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Wang Xiangyu (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Sharon Lim Pei Siang (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Ji Lin (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Rathin Mandal (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Raju Mani (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), Jong Ming Chinq (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore), and Ye Yong Liang (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Singapore)*

Multi-chip Stacked Memory Module Development Using Chip to Wafer (C2W) Hybrid Bonding for Heterogeneous Integration Applications 2024

*Nagendra Sekhar Vasarla (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Dileep Kumar Mishra (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Sasi Kumar Tippabhotla (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Chandra Rao B.S.S (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Ismael Cereno Daniel (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), Ser Choong Chong (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore), and Srinivasa Rao Vempati (Institute of Microelectronics (IME), Agency for Science, Technology and Research (A*STAR), Republic of Singapore)*

Error Estimation in Immersion Cooling Liquid Dk-Df Extraction Using Different Methods 2031

Saikat Mondal (Intel Corporation, USA), Xenofon Konstantinou (Intel Corporation, USA), Cemil S. Geyik (Intel Corporation, USA), Zhichao Zhang (Intel Corporation, USA), and Kemal Aygun (Intel Corporation, USA)

Fluidic Self Alignment for Hybrid Bonding Using Intel Process 2037
Feras Eid (Intel Corporation, USA), Yi Shi (Intel Corporation, USA), Golsa Naderi (Intel Corporation, USA), Shashi Bhushan Sinha (Intel Corporation, USA), Rob Jordan (Intel Corporation, USA), Wenhao Li (Intel Corporation, USA), Charles El Helou (Intel Corporation, USA), Felipe Bedoya (Intel Corporation, USA), Anandi Roy (Intel Corporation, USA), Tayseer Mahdi (Intel Corporation, USA), Jiun-Ruey Chen (Intel Corporation, USA), Brandon Rawlings (Intel Corporation, USA), Brian Barley (Intel Corporation, USA), Sheena Benson (Intel Corporation, USA), Seyed Hadi Zandavi (Intel Corporation, USA), Michael Baker (Intel Corporation, USA), Preston Myers (Intel Corporation, USA), Mark Allen (Intel Corporation, USA), Albert Lopez (Intel Corporation, USA), Joe Saucedo (Intel Corporation, USA), Khant Minn (Intel Corporation, USA), Siyan Dong (Intel Corporation, USA), Jeff Bielefeld (Intel Corporation, USA), Richard Vreeland (Intel Corporation, USA), William Brezinski (Intel Corporation, USA), Fernando Olmos (Intel Corporation, USA), Christopher Woods (Intel Corporation, USA), and Johanna Swan (Intel Corporation, USA)

An Advanced Remote-Plasma Assisted Ozone-Ethylene Radical (OER) Process for Cu-SiO2 Hybrid Bonding Yield Enhancement 2042
Tatsunori Shino (Meiden Nanoprocess Innovations, Inc., Japan), Mariappan Murugesan (Tohoku University, Japan), Kiyoharu Mori (Tohoku University, Japan), Bungo Tanaka (Tohoku University, Japan), Eitaro Toyama (Meiden Nanoprocess Innovations, Inc., Japan), Tetsuya Nishiguchi (Meiden Nanoprocess Innovations, Inc., Japan), and Takafumi Fukushima (Tohoku University, Japan)

Influence of Temporary Rigid Carrier Structure on Warpage during Wafer Panel level packaging 2047
Yoshinori Matsuura (Mitsui Mining and Smelting Co., Ltd., Japan), Kyohei Kuwahara (Mitsui Mining and Smelting Co., Ltd., Japan), Yukiko Kitabakake (Mitsui Mining and Smelting Co., Ltd., Japan), Takenori Yanai (Mitsui Mining and Smelting Co., Ltd., Japan), Masahiro Koide (Mitsui Mining and Smelting Co., Ltd., Japan), and Joji Fujii (Mitsui Mining and Smelting Co., Ltd., Japan)

Extremely Advanced Substrate as an Integrated Package Solution (iPaS) for Next Generation High Performance Computing (HPC) Applications 2053
Tatsuya Kitamura (Murata Manufacturing Co., Ltd., Japan), Takeshi Furukawa (Murata Manufacturing Co., Ltd., Japan), Shuhei Yamada (Murata Manufacturing Co., Ltd., Japan), Koshi Himeda (Murata Manufacturing Co., Ltd., Japan), and Atsushi Yamamoto (Murata Manufacturing Co., Ltd., Japan)

A CMP Process for Hybrid Bonding Application with Conventional / nt-Cu and SixNy / SixOy Dielectrics 2058
T. S. Widodo (Intel Corporation, USA), X. F. Brun (Intel Corporation, USA), P. Lianto (Applied Materials, Singapore), A. Tan (Applied Materials, Singapore), J. Lie (Applied Materials, Singapore), P. Lim (Applied Materials, Singapore), and G. H. See (Applied Materials, Singapore)

Effect of Material Aging on the Reliability of An Automotive BGA Device Under Temperature Cycling Test Conditions 2062
Abdullah Fahim (NXP Semiconductors, USA), Ryan Zhang (NXP Semiconductors, USA), Amar Mavinkurve (NXP Semiconductors, Netherland), Sandeep Shantaram (NXP Semiconductors, USA), Ali Rezaie Adli (NXP Semiconductors, Netherland), Wiwat Tanwongwan (NXP Semiconductors, Thailand), and Torsten Hauck (NXP Semiconductors, Germany)

Overlay Challenges of Extremely Large Exposure Field, Fine Resolution Lithography Due to Alignment Solution Errors and a Solution Using Early Zone Corrections in Advanced IC Substrates 2070
John Chang (Onto Innovation Inc., USA), Xin Song (Onto Innovation Inc., USA), Timothy Chang (Onto Innovation Inc., USA), and Keith Best (Onto Innovation Inc., USA)

World's Smallest, Membrane-Based Capacitive Differential Pressure Sensor- Package Structure, Material Selection, Assembly Challenges and Solutions 2075
Km Rafidh Hassan (Renesas Electronics America Inc., USA), Gaurav Mehrotra (Renesas Electronics America Inc., USA), Hazel Caballero (Renesas Electronics America Inc., USA), Young Kim (Renesas Electronics America Inc., USA), Steven Lee (Renesas Electronics America Inc., USA), Karim Allidina (MEMS Vision International Inc., Canada), Tommy Tsang (MEMS Vision International Inc., Canada), Mohannad Elsayed (MEMS Vision International Inc., Canada), and Hani Tawfik (MEMS Vision International Inc., Canada)

Packaging Challenges and Solutions for Next Generation Low-Profile WLCSP 2083
Shih-Wen Tang (Renesas Electronics Corporation, Taiwan), Che-Han Li (Renesas Electronics Corporation, Taiwan), Hsin-Hung Huang (Renesas Electronics Corporation, Taiwan), Yu-Shan Wei (Renesas Electronics Corporation, Taiwan), Jesus Mennen Belonio (Renesas Electronics Corporation, Germany), and Baltazar Canete (Renesas Electronics Corporation, Germany)

A Study on Novel Low Temperature Soldering Process Using Vapor Phase 2091
Youngja Kim (Samsung Electronics Co., Ltd., South Korea), Woojin Choi (Samsung Electronics Co., Ltd., South Korea), Seungyeop Oh (Samsung Electronics Co., Ltd., South Korea), Sinyeop Lee (Samsung Electronics Co., Ltd., South Korea), and Sunwon Kang (Samsung Electronics Co., Ltd., South Korea)

Numerical Study on Hybrid Discontinuous Microchannel Heat Sink Combining Manifold with Pin Fins(DMC-MPF) for High Power Electronic Device 2096
Jianyu Du (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China), Lang Chen (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China), Ran Hu (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China), Huaiqiang Yu (26th Research Institute of China Electronics Technology Group Corporation, China), Chi Zhang (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China), and Wei Wang (Peking University, China; National Key Lab of Micro/Nano Fabrication Technology, China; Beijing Advanced Innovation Center for Integrated Circuits, China)

Room-Temperature Hybrid Bonding of Via-Middle TSV Wafer Fabricated by Direct Si/Cu Grinding and Residual Metal Removal 2101
Naoya Watanabe (National Institute of Advanced Industrial Science and Technology, Japan), Hiroshi Yamamoto (Okamoto Machine Tool Works, Ltd., Japan), and Takahiko Mitsui (Okamoto Machine Tool Works, Ltd., Japan)

Ultra Thin Fan-Out 3D WLCSP Heterogeneous Integration Packaging 2107
Li Jay (Siliconware Precision Industries Co. Ltd.), Zhang Zen-Wei (Siliconware Precision Industries Co. Ltd.), Lin Sam (Siliconware Precision Industries Co. Ltd.), Lin Vito (Siliconware Precision Industries Co. Ltd.), Teny Shih (Siliconware Precision Industries Co. Ltd.), Kao Nicholas (Siliconware Precision Industries Co. Ltd.), and Wang Yu-Po (Siliconware Precision Industries Co. Ltd.)

High RF-high Power Dual Capacitively Coupled Plasma Characteristics Dependency on Process Parameters: A Finite Element Analysis Approach 2112
Md Ishak Khan (Substrate Packaging Technology Development, Intel Corporation), Xiyu Hu (Substrate Packaging Technology Development, Intel Corporation), Wei Wei (Substrate Packaging Technology Development, Intel Corporation), Haobo Chen (Substrate Packaging Technology Development, Intel Corporation), Nicholas Haehn (Core Competency, Intel Corporation), Xiaoying Guo (Substrate Packaging Technology Development, Intel Corporation), Leonel Arana (Substrate Packaging Technology Development, Intel Corporation), and Kensuke Akazawa (ULVAC Inc.)

Development of a Reusable Smart-Catheter System for Improved Urinary Health Monitoring 2117
Zhi Dou (State University of New York at Binghamton, USA), WT Al-Shaibani (State University of New York at Binghamton, USA), Erika Solano (State University of New York at Binghamton, USA), Mohammed Alhendi (State University of New York at Binghamton, USA), Riadh Al-Haidari (State University of New York at Binghamton, USA), Abdullah Obeidat (State University of New York at Binghamton, USA), Mark Schadt (State University of New York at Binghamton, USA), Mark Poliks (State University of New York at Binghamton, USA), Daniel Wollin (CathBuddy Inc., USA), Souvik Paul (CathBuddy Inc., USA), and Kara Allanach (CathBuddy Inc., USA)

Focal Extension – A Novel Lithography Technique in Direct-Write Laser Lithography to Enable Fine-Pitch Patterning over Large Topography 2125
Golam Sabbir (University of California, Los Angeles, USA) and Subramanian Iyer (University of California, Los Angeles, USA)

Session 41: Student Interactive Presentations

Low Temperature Cu/SiO_2 Hybrid Bonding Using Area-Selective Metal Passivation (Interface Metal) Technology for 3D IC and Advanced Packaging 2131
Mu-Ping Hsu (Institute of Electronics National Yang Ming Chiao Tung University, Taiwan), Wen-Tsu Tsai (International College of Semiconductor Technology National Yang Ming Chiao Tung University, Taiwan), Ou-Hsiang Lee (Electronics and Optoelectronics System Research Laboratories, Industrial Technology Research Institute (ITRI), Taiwan), Chi-Yu Chen (Institute of Pioneer Semiconductor Innovation National Yang Ming Chiao Tung University, Taiwan), Tzu-Ying Kuo (Electronics and Optoelectronics System Research Laboratories, Industrial Technology Research Institute (ITRI), Taiwan), Hsiang-Hung Chang (Electronics and Optoelectronics System Research Laboratories, Industrial Technology Research Institute (ITRI), Taiwan), Hsin-Chi Chang (Department of Electronics Engineering National Yang Ming Chiao Tung University, Taiwan), Zhong-Jie Hong (International College of Semiconductor Technology National Yang Ming Chiao Tung University, Taiwan), and Kuan-Neng Chen (Institute of Electronics National Yang Ming Chiao Tung University, Taiwan)

Vertical Power Delivery for High Performance Computing Systems with Buck-Derived Regulators 2136
Sriharini Krishnakumar (University of Illinois Chicago, USA), Mingeun Choi (Georgia Institute of Technology, USA), Ramin Rahimzadeh Khorasani (Penn State University, USA), Rohit Sharma (IIT Ropar, India), Madhavan Swaminathan (Penn State University, USA), Satish Kumar (Georgia Institute of Technology, USA), and Inna Partin-Vaisband (University of Illinois Chicago, USA)

Multi-objective Optimization of a 1200-V Fan-Out Panel-Level SiC MOSFET Packaging with Improved Genetic and Particle Swarm Algorithms 2143
Xuyang Yan (Fudan University, China), Wei Chen (Fudan University, China), Wenyu Li (Fudan University, China), Jing Jiang (Fudan University, China), Xuejun Fan (Lamar University, USA), Guoqi Zhang (Delft University of Technology, Netherlands), and Jiajie Fan (Fudan University, China; University in Ningbo, China)

Packaging of Photonic Neural Network Accelerators 2150
Russell L. T. Schwartz (University of Florida, USA), Belal Jahannia (University of Florida, USA), Salem Altaleb (University of Florida, USA), Hangbo Yang (University of Florida, USA), Nicola Peserico (University of Florida, USA), Hamed Dalir (University of Florida, USA), and Volker J. Sorger (University of Florida, USA)

Comparison of Different Copper Nitride Passivation Layers Fabrication Methodology and Optimal Growth Condition for Low Temperature Copper-to-Copper Bonding in Advanced Packaging 2157
Chiao-Yen Wang (Institute of Electronics, National Yang Ming Chiao Tung University, Taiwan), Tzu-Heng Hung (Institute of Electronics, National Yang Ming Chiao Tung University, Taiwan), Ping-Jung Liu (International College of Semiconductor Technology, Taiwan), and Kuan-Neng Chen (Institute of Electronics, National Yang Ming Chiao Tung University, Taiwan)

Fabrication and Testing of In-Line Structures for Non-Destructive Study of Solder Electromigration: Applications to SnBi Low Temperature Solder 2163
Chetan Jois (Purdue University, USA), Pei-En Chou (Purdue University, USA), and Ganesh Subbarayan (Purdue University, USA)

Application of Elevated-Laser-Liquid-Phase-Epitaxy (ELLPE) Technique on Different Oriented Wafers for Monolithic 3DIC Integration 2167
Bo-Jheng Shih (National Chiao Tung University, Taiwan), Yu-Ming Pan (National Chiao Tung University, Taiwan), Chiao-Yen Wang (National Chiao Tung University, Taiwan), Huan-Yu Chiu (National Chiao Tung University, Taiwan), Chih-Chao Yang (Taiwan Semiconductor Research Institute, Taiwan), Chang-Hong Shen (Taiwan Semiconductor Research Institute, Taiwan), Huang-Chung Cheng (National Chiao Tung University, Taiwan), and Kuan-Neng Chen (National Chiao Tung University, Taiwan)

Manufacturing and Characterization of Planar Transformers as Molded Interconnect Device Technology Component for an Industrial Production 2172
Tim Nils Bierwirth (Leibniz University Hannover, Germany), Sebastian Bengsch (Ensinger GmbH, Germany), Michael Werner (Ensinger GmbH, Germany), Rico Wachs (Tridelta Weichferrite GmbH, Germany), Christian Henne (Ensinger GmbH, Germany), Stefan Bur (Ensinger GmbH, Germany), Folke Dencker (Leibniz University Hanover, Germany), and Marc Christopher Wurz (Leibniz University Hannover, Germany)

Fine Pitch (≤ 10µm) Die to Wafer Cu-Cu TCB on Organic Polymer Build Up Films 2178
Vineeth Harish (UCLA Center for Heterogeneous Integration and Performance Scaling, USA), Krutikesh Sahoo (UCLA Center for Heterogeneous Integration and Performance Scaling, USA), Kai Zheng (Applied Materials, USA), Gilbert Park (Applied Materials, USA), Han-Wen Chen (Applied Materials, USA), Steven Verhaverbeke (Applied Materials, USA), and Subramanian S. Iyer (UCLA Center for Heterogeneous Integration and Performance Scaling, USA)

Novel Single and Co-Ion Implantation Induced Backside Etch Stop Structures for 3D Multilayer Stacked Package 2184
Yen-Shuo Chen (National Yang Ming Chiao Tung University Hsinchu), Tzu-Wei Chiu (Thinchipway CO., LTD., Taiwan), Hua-Tai Fan (National Yang Ming Chiao Tung University, Taiwan), Yu-Chien Ko (National Yang Ming Chiao Tung University, Taiwan), Chu-Chi Chen (Taiwan Semiconductor Research Institute, Taiwan), and Fu-Hsiang Ko (National Yang Ming Chiao Tung University, Taiwan)

New Method of Creating Through Silicon Vias for Next Generation Packaging Techniques 2189
Zachary Nelson (Univ. of California, Santa Barbara), Alice Mo (Univ. of California, Santa Barbara), and Luke Theogarajan (Univ. of California, Santa Barbara)

Electrospray Printed Silver Films for EMI Shielding of SiP Architectures 2194
Emma E. Pawliczak (Binghamton University, USA) and Paul R. Chiarot (Binghamton University, USA)

Latency Insertion Method for Accelerated Simulation of Memristor Crossbar Array in Neuromorphic Chip 2200
Yi Zhou (University of Illinois at Urbana-Champaign, USA), Hanzhi Ma (Zhejiang University, China), Junwei Yu (Zhejiang University, China), Tahsin Shameem (University of Illinois at Urbana-Champaign, USA), Zohreh Salehi (University of Illinois at Urbana-Champaign, USA), Shaloo Rakheja (University of Illinois at Urbana-Champaign, USA), Erping Li (Zhejiang University, China), and José E. Schutt-Ainé (University of Illinois at Urbana-Champaign, USA)

A Novel Parallel Interconnection Approach to Reduce Shading Losses on Submillimeter Concentrated Photovoltaic Technologies 2205
Corentin Jouanneau (Institut Interdisciplinaire d'Innovation Technologique (3iT), Université de Sherbrooke, Canada; Laboratoire Nanotechnologies Nanosystèmes (LN2) – CNRS, Canada), Thomas Bidaud (Institut Interdisciplinaire d'Innovation Technologique (3iT), Université de Sherbrooke, Canada; Laboratoire Nanotechnologies Nanosystèmes (LN2) – CNRS, Canada), Artur Turala (Institut Interdisciplinaire d'Innovation Technologique (3iT), Université de Sherbrooke, Canada; Laboratoire Nanotechnologies Nanosystèmes (LN2) – CNRS, Canada), David Danovitch (Institut Interdisciplinaire d'Innovation Technologique (3iT), Université de Sherbrooke, Canada; Laboratoire Nanotechnologies Nanosystèmes (LN2) – CNRS, Canada), Gwenaëlle Hamon (Institut Interdisciplinaire d'Innovation Technologique (3iT), Université de Sherbrooke, Canada; Laboratoire Nanotechnologies Nanosystèmes (LN2) – CNRS, Canada), and Maxime Darnon (Institut Interdisciplinaire d'Innovation Technologique (3iT), Université de Sherbrooke, Canada; Laboratoire Nanotechnologies Nanosystèmes (LN2) – CNRS, Canada)

Fabrication and Packaging of a Heterogeneously Integrated, Flexible Micro-Display and Optical Modeling for Quantum Dot Integration 2211
Henry Sun (UCLA, USA), Harshal Sonagara (UCLA, USA), Guangqi Ouyang (UCLA, USA), Lisong Xu (Applied Materials Inc, USA), Kai Ding (Applied Materials Inc, USA), Mingwei Zhu (Applied Materials Inc, USA), Chang Liu (UCLA, USA), and Subramanian Iyer (UCLA, USA)

Advanced Bonding Process Based on Intense Pulsed Light Irradiation for Solder Bump in Flip-Chip Package 2218
Seong-Ung Ryu (Hanyang University, South Korea), Jong-Whi Park (Hanyang University, South Korea), Young-Min Ju (Hanyang University, South Korea), and Hak-Sung Kim (Hanyang University, South Korea)

Design Space Exploration for Power Delivery Network in Next Generation 3D Heterogeneous Integration Architectures 2223
Madison Manley (Georgia Institute of Technology, USA), Ankit Kaul (Georgia Institute of Technology, USA), and Muhannad S. Bakir (Georgia Institute of Technology, USA)

Hybrid Interconnect Infrastructure for Inter-Chiplet Communication in Wafer-Scale Systems 2229
Yousef Safari (McGill University, Canada), Rezvan Mohammadrezaee (McGill University, Canada), Dima Al Saleh (McGill University, Canada), and Boris Vaisband (McGill University, Canada)

Reliability of Indium Solder Joints Using a Laser-Assisted Bonding (LAB) Process at Room Temperature 2237
Ji Eun Jung (ETRI, Korea), Yong-Sung Eom (ETRI, Korea), Jiho Joo (ETRI, Korea), Gwang-Mun Choi (ETRI, Korea), Jung-Ho Shin (ETRI, Korea), Chanmi Lee (ETRI, Korea), Ki-Seok Jang (ETRI, Korea), Jin-Hyuk Oh (ETRI, Korea), Ga Eun Lee (ETRI, Korea), Kwang-Seong Choi (ETRI, Korea), and Seung-Yoon Lee (Hanbat National Unibersity, Korea)

Tailored Multi-mode, High-Q Superconducting Nb Resonators: Unique Platform for Magnon-Photon Coupling 2244
Muntasir Mahdi (Auburn University, USA), Bhargav Yelamanchili (Auburn University, USA), Archit Shah (Auburn University, USA), Sherman E. Peek (Auburn University, USA), Yuzan Xiong (The University of North Carolina at Chapel Hill, USA), Andrew Christy (The University of North Carolina at Chapel Hill, USA), Dan-Chi Nguyen (Ewha Womans University, ROK), Tae Hee Kim (Ewha Womans University, ROK), Wei Zhang (The University of North Carolina at Chapel Hill, USA), and Michael C. Hamilton (Auburn University, USA)

Magnetic Cores for High Conversion Ratio Package Embedded Inductors 2250
Sai Saravanan Ambi Venkataramanan (Georgia Institute of Technology, USA), Prahalad Murali (Georgia Institute of Technology, USA), Dustin Allen Gilbert (The University of Tennessee, USA), Mohanalingam Kathaperumal (Georgia Institute of Technology, USA), and Mark D. Losego (Georgia Institute of Technology, USA)

Unveiling Mechanical Stress in Lithium-Metal Batteries for Flexible Electronics: A Novel Approach with Optical Techniques and Artificial Interfaces 2256
Mayukh Nandy (Arizona State University, USA), Siyang Liu (Arizona State University, USA), Todd Houghton (Arizona State University, USA), Haiwei Wu (Arizona State University, USA), Candace Chan (Arizona State University, USA), and Hongbin Yu (Arizona State University, USA)

Preparation of SAC305 Solder Specimens that Mimic the Microstructures of a Micro Solder Ball 2261
You-Gwon Kim (Hanyang University, South Korea, South Korea), Heon-Su Kim (Hanyang University, South Korea), Tae-Wan Kim (Hanyang University, South Korea), Seoung-Ung Ryu (Hanyang University, South Korea), Hak-Sung Kim (Hanyang University, South Korea), Yong-rae Jang (University of Maryland, USA), Bongtae Han (University of Maryland, USA), Jun-Hyeong Lee (DUKSAN HI-METAL Co., South Korea), and Jin-Kyu Kim (DUKSAN HI-METAL Co., South Korea)

RF Energy Harvesting Hybrid RFID Based Sensors for Smart Agriculture Applications 2267
Yihang Chu (Michigan State University, USA), Ethan Kepros (Michigan State University, USA), Bhargav Avireni (Michigan State University, USA), Sambit Kumar Ghosh (Michigan State University, USA), and Premjeet Chahal (Michigan State University, USA)

Influence of Nickel and Bismuth Addition on the Mechanical Shear Strength of SAC+ Ni, Bi Solders Under Isothermal Aging and Multiple Reflows 2272
Jyothsna Bandayagari (Watson Institute of Systems Excellence, USA), Santosh Kudtarkar (Analog Devices, USA), Arun Raj (Analog Devices, USA), Shafi Saiyed (Analog Devices, USA), Darshil Patel (Watson Institute of Systems Excellence, USA), and Yingge Zhou (Watson Institute of Systems Excellence, USA)

Process Development of Manifold Microchannels Cooling for Embedded Silicon Fan-Out (MMC-eSiFO) Package 2280
Zhou Yang (Peking University, China), Yuchi Yang (Peking University, China), Peijue Lyu (Peking University, China), Jianyu Du (Peking University, China), Lang Chen (Peking University, China), Jin Kang (Semiconductor Technology Innovation Center, China), Weihai Bu (Semiconductor Technology Innovation Center, China), Kai Zheng (Semiconductor Technology Innovation Center, China), Yikang Zhou (Semiconductor Technology Innovation Center, China), Chi Zhang (Peking University, China), and Wei Wang (Peking University, China)

Demystifying Edge Cases in Advanced IC Packaging Inspection Through Novel Explainable AI Metrics 2286
Shajib Ghosh (University of Florida, USA), Antika Roy (University of Florida, USA), Md Mahfuz Al Hasan (University of Florida, USA), Patrick Craig (University of Florida, USA), Nitin Varshney (University of Florida, USA), Sanjeev J. Koppal (University of Florida, USA), and Navid Asadizanjani (University of Florida, USA)

Effective Heat Dissipation of White Laser Diodes by Welding Metallized Phosphor-Sapphire . 2294
Zikang Yu (Huazhong University of Science and Technology, China), Jiuzhou Zhao (Huazhong University of Science and Technology, China), Yang Peng (Huazhong University of Science and Technology, China), and Mingxiang Chen (Huazhong University of Science and Technology, China)

Impact of Non-Coplanarities on Microstructure and Properties of Sintered NP-Cu Interconnections 2298
Ali Amirnasiri (Georgia Institute of Technology, USA), Ramón A. Sosa (Georgia Institute of Technology, USA), Mengkun Tian (Georgia Institute of Technology, USA), Antonia Antoniou (Georgia Institute of Technology, USA), and Vanessa Smet (Georgia Institute of Technology, USA)

Author Index