

## **EPS ECTC Student Travel Grant Awards**

### **2022 Recipients**

Ankitha Rao, Manipal Institute of Technology, Manipal Academy of Higher Learning  
Paper: "Challenges in Packaging of Flexible and Wearable Supercapacitors Against Humidity Variations"

Takshashila Patahde, Dhirubhai Ambani Institute of Information and Communication Technology  
Paper: "Low Power ALU Design with incorporation of MWCMTB On-Chip interconnects"

Ramesh Kudalippallyalil, Information Sciences Institute (ISI/USC)  
Paper: "Heterogeneously Integrated Quantum Chip Interposer Packaging"

Yu-Tao Yang, UCLA ECE  
Paper: "RF Characterization on Nb-Based Superconducting Silicon Interconnect Fabric for Future Large-Scale Quantum Applications"

Zeinab Shaban, Tyndall National Institute  
Paper: "Integration of High Performance GaN LEDs for Communication Systems and Smart Society"

Akeeb Hassan, Florida International University  
Paper: "Self-Healing of Interconnect Cracks for Reliable and Defect-Free Smart Manufacturing of Flexible Packages"

Peng Zhao, Nanyang Technological University  
Paper: "The Integration of Grounding Plane into TSV Integrated Ion Trap for Efficient Thermal Management in Large Scale Quantum Computing Device"

Firas Alshatnawi, Binghamton University  
Paper: "High Temperature Die Interconnection Approaches"

Yi Zhou, Georgia Tech  
Paper: "Mechanical and Ka-Band Electrical Reliability Testing of Interconnects in 5G Wearable System-on-Package Designs Under Bending"

Xiaofan Jia, Georgia Tech  
Paper: "Antenna-Integrated, Die-Embedded Glass Package for 6G Wireless Applications"

Kruitkesh Sahoo, UCLA  
Paper: "Functional Demonstration of  $< 0.4$  pJ/bit,  $9.8 \mu\text{m}$  Fine-Pitch Dielet-to-Dielet Links for Advanced Packaging Using Silicon Interconnect Fabric"

Woosol Lee, University of Florida  
Paper: "Flexible Metamaterial Lens for Magnetic Field and Signal-to-Noise Ratio Improvements in 1.5 T and 3 T Magnetic Resonance Imaging"

### **2021 Recipients**

Ramon Sosa, Georgia Institute of Technology  
Paper: "Low-temperature all-Cu interconnections formed by pressure-less sintering of Cu pillars with nanoporous-Cu caps"

Claudio Alvarez, Georgia Institute of Technology

Paper: "Demonstration of a High-Inductance, High-Density, and Low DC Resistance Compact Embedded Toroidal Inductor for IVR"

Yuki Susumago, Tohoku University

Paper: "FOWLP-Based Flexible Hybrid Electronics with 3D-IC Chiplets for Smart Skin Display"

Woosol Lee, University of Florida

Paper: "3D integrated high gain rectenna in package with metamaterial superstrates for high efficiency wireless power transfer applications"

Tomo Odashima, Tohoku University

Paper: "Wafer-Level Flexible 3D Corrugated Interconnect Formation for Scalable In-Mold Electronics with Embedded Chiplets"

Peng Zhao, Nanyang Technological University

Paper: "Heterogenous Integration of Silicon Ion Trap and Glass Interposer for Scalable Quantum Computing Enabled by TSV, Micro-bumps, and RDL"

Kai-Cheng Shie, National Chiao Tung University

Paper: "Hybrid bonding of nanotwinned copper/organic dielectrics with low thermal budget"

Seokkan Ki, Kyung Hee University

Paper: "Rapid Enhancement of Thermal Conductivity by Incorporating Oxide-Free Copper Nanoparticle Clusters for Highly Conductive Liquid Metal-based Thermal Interface Materials"

Sunil Kumar Panigrahy, National Tsing Hua University

Paper: "Study on an Artificial Intelligence Based Kernel Ridge Regression Algorithm for Wafer Level Package Reliability Prediction"

Jia Juen Ong, National Chiao Tung University

Paper: "Two-step fabrication process for die-to-die and die-to-wafer Cu-Cu bonds"

## **2020 Recipients**

Lin Hou, KU Leuven

Paper: "A novel intermetallic compound insertion bonding to improve throughput for sequential 3D stacking"

Noriyuki Takahashi, Tohoku University

Paper: "RDL-first Flexible FOWLP Technology with Dielets Embedded in Hydrogel"

Claudio Alvarez, Georgia Institute of Technology

Paper: "Design and Demonstration of Single and Coupled Embedded Toroidal Inductors for 48V to 1V Integrated Voltage Regulators"

Musa Mahmood, Georgia Institute of Technology

Paper: "Smart and Connected Physiological Monitoring Enabled by Stretchable Bioelectronics and Deep-Learning Algorithm"

Stephen Anderson, Rensselaer Polytechnic Institute

Paper: "Integrated Silicon Photonic True-Time Delay Beam-Former for Wide-Band Phased-Array Antenna"

S. W. Liu, National Tsing Hua U.

Paper: "Prediction of Fan-out Panel Level Warpage using Neural Network Model with Edge Detection Enhancement"

Cheryl Selvanayagam, Singapore University of Technology and Design

Paper: "Learning the Stress-Strain Relationships of Ultra-Thin Package Materials using a Bayesian Approach"

Ying Yang, University of Sherbrooke

Paper: "A Mechanistic Study of Underfill Cracks by the Confocal-DIC Method"

Pengbo Yu, Tsinghua University

Paper: "Coaxial Through-Silicon-Vias Using Low- $\kappa$  SiO<sub>2</sub> Insulators"

Daquan Yu, Xiamen University

Paper: "Development of Embedded Glass Wafer Fan-Out Package With 2D Antenna Arrays for 77GHz Millimeter-wave Wireless Communication"

### **2019 Recipients**

Arsalan Alam, University of California, Los Angeles

Paper: "Heterogeneous Integration of a Fan-Out Wafer-Level Packaging Based Foldable Display on Elastomeric Substrate"

Muhammad Ali, Georgia Institute of Technology

Paper: "3D Glass Package-Integrated, High Performance Power Dividing Networks for 5G Broadband Antennas"

Claudio Alvarez, Georgia Institute of Technology

Paper: "Open and Closed Loop Inductors for High Efficiency System on Package Integrated Voltage Regulators"

Deepayan Banerjee, IIT Delhi, India

Paper: "A Novel Design of a Bandwidth Enhanced Dual-Band Impedance Matching Network With Coupled Line Wave Slowing"

SivaChandra Jangam, University of California, Los Angeles

Paper: "Effects of Oven and Laser Sintering Parameters on the Electrical Resistance of IJP Nano-Silver Traces on Mesoporous PET Before and During Fatigue Cycling"

Gurvinder Singh Khinda, Binghamton University

Paper: "Fine-Pitch ( $\leq 10 \mu\text{m}$ ) Direct Cu-Cu Interconnects using In-situ Formic Acid Vapor Treatment"

Yuki Susumago, Tohoku University

Paper: "Mechanical and Electrical Characterization of FOWLP-Based Flexible Hybrid Electronics (FHE) for Biomedical Sensor Application"

Tiwei Wei, IMEC

Paper: "First Demonstration of a Low Cost/Customizable Chip Level 3D Printed Microjet Hotspot-Targeted Cooler for High Power Applications"

Jikai Xu, Harbin Institute of Technology

Paper: "Direct Heterogeneous Bonding of SiC to Si, SiO<sub>2</sub>, and Glass for High-Performance Power Electronics and Bio-MEMS"

Tilo Hongwei Yang, National Taiwan University

Paper: "A single bonding process to achieve various organic-inorganic substrate integration in IoT"

**2018 Recipients**

Luca Del Carro, ETH Zurich

Paper: "Laser sintering of dip-based all-copper interconnects"

Normand-Pierre Goodhue, Université de Sherbrooke

Paper: "Warpage Control during Mass Reflow Flip Chip Assembly using Temporary Adhesive Bonding"

Siva Chandra Jangam, University of California, Los Angeles

Paper: "Electrical Characterization of High Performance Fine Pitch Interconnects in Silicon Interconnect Fabric"

Chenhui Li, Eindhoven University of Technology

Paper: "400 Gbps 2-Dimensional Optical Receiver Assembled on Wet Etched Silicon Interposer"

Tong-Hong Lin, Georgia Institute of Technology

Paper: "Novel 3D-/Inkjet-Printed Flexible On-Package Antennas, Packaging Structures, and Modules for Broadband 5G Applications"

Nivesh Mangal, Ghent University

Paper: "Integration of Ball Lens in Through-Package Via to Enable Photonic Chip-to-Board Coupling"

Saikat Mondal, Michigan State University

Paper: "A Harmonic RF Phase-Shifter based Wireless pH Sensor"

Bo Song, Georgia Institute of Technology

Paper: "Stretchable, Printable and Electrically Conductive Composites for Wearable RF Antennas"

**2017 Recipients**

Jiawei Marvin Chan, Nanyang Technological University

Paper: "Reliability Evaluation of Copper (Cu) Through-Silicon Via (TSV) Barrier and Dielectric Liner by Electrical Characterization and Physical Failure Analysis (PFA)"

Luca Del Carro, ETH Zurich

Paper: "Morphology study of bimodal-particle-based all-copper interconnects formed at low sintering temperature"

Alexander Hanss, Technische Hochschule Ingolstadt

Paper: "New Method to Separate Failure Modes by Transient Thermal Analysis of High Power LEDs"

Chenhui Li, Eindhoven University of Technology

Paper: "3D Packaging of Embedded Opto-electronic Die and CMOS IC Based on Wet Etched Silicon Interposer"

Junjie Li, Huazhong University of Science and Technology

Paper: "Low-temperature and low-pressure Cu-Cu bonding by pure Cu nanosolder paste for wafer-level packaging"

Muhammad Amin Saleem, Smoltek AB  
Paper: "On-Chip solid-state micro-supercapacitor"

Ninad Shahane, Georgia Institute of Technology  
Paper: "Enabling chip-to-package Cu-Cu interconnections: design of engineered bonding interfaces for improved manufacturability and low-temperature bonding"

Divya Taneja, CEA-LETI  
Paper: "Cu-SnAg interconnects evaluation for the assembly at 10 $\mu$ m and 5  $\mu$ m pitch"

### **2016 Recipients**

Manuela Loeblein, Nanyang Technological University  
Paper: "Heat Dissipation Enhancement of 2.5D Package with 3D Graphene & 3D Boron Nitride Networks as Thermal Interface Material (TIM)"

Akira Yamauchi, Keio University  
Paper: "Graded-Index Multimode Polymer Optical Waveguide Enabling Low Loss and High Density 3D On-Board Integration"

Yan Yang, IME  
Paper: "3D Silicon Photonics Packaging Based on TSV Interposer for High Density On-Board Optics Module"

Jonas Zürcher, Swiss Federal Institute of Technology  
Paper: "All-Copper Flip Chip Interconnects by Pressureless and Low Temperature Nanoparticle Sintering"

Chenhui Li, Eindhoven University of Technology  
Paper: "Wet Etched Silicon Interposer for the 2.5D Stacking of CMOS and Optoelectronic Dies"

Connor Howe, Virginia Commonwealth University  
Paper: "An Implantable, Stretchable Microflow Sensor Integrated with a Thin-Film Nitinol Stent"

Jen-Jui Yu, National Taiwan University  
Paper: "Choice of Intermetallics for Structural Applications in Micro Joints of Three-Dimensional Integrated Circuits (3D ICs)"

Bruce Chou, Packaging Research Center at Georgia Tech  
Paper: "Design and Demonstration of Micro-Mirror and Lens for Low-loss and Low-Cost Single-Mode Fiber Coupling in 3D Glass Photonic Interposers"

### **2015 Recipients**

Sarkis Babikian, University of California, Irvine  
Paper: "Integrated Bioflexible Electronic Device for Electrochemical Analysis of Blood"

Ossama El Bouayadi, CEA-LETI  
Paper: "Silicon Interposer: A Versatile Platform Towards Full-3D Integration of Wireless Systems at Millimeter-Wave Frequencies"

Masaki Ohyama, Waseda University  
Paper: "Hybrid Bonding of Cu/Sn Microbump and Adhesive with Silica Filler for 3D Interconnection of Single-Micron Pitch"

Yu-Cheng Hsieh, National Chiao Tung University

Paper: "Development and Electrical Investigation of Novel Fine-Pitch Cu/Sn Pad Bumping Using Ultra-Thin Buffer Layer Technique in 3D Integration"

Jonas Zürcher, IBM Research - Zurich

Paper: "Nanoparticle Assembly and Sintering Towards All-Copper Flip Chip Interconnects"

Bo Song, Georgia Institute of Technology

Paper: "Flexible Solid-State Micro-Supercapacitors for On-Chip Energy Storage Devices"

Xiao Hu, City University of Hong Kong

Paper: "Novel WO<sub>3</sub> Nanoparticles Modified Electroless Metallization to Retard Interfacial Reaction and Reinforce the Reliability of Solder Interconnection"

Aliaksei Klyshko, University of Rome la Sapienza

Paper: "Oxidized porous silicon: the route to low-cost, low loss and high performance 3D tapered coupler for silicon photonics circuits and MCM optical backplane"

### **2014 Recipients**

William Krieger, Georgia Institute of Technology

Paper: "A Cohesive Zone Method for Prediction of Interfacial Failure In Microelectronic Systems"

Taoran Le, Georgia Institute of Technology

Paper: "Enhanced-Performance Wireless Conformal "Smart Skins" Utilizing Inkjet-Printed Porous Carbon-Nanostructures"

Yu Ji, Southeast University

Paper: "Preparation of a Micro Rubidium Vapor Cell and Its Integration in a Chip-Scale Atomic Magnetometer"

Hideto Hashiguchi, Tohoku University

Paper: "Temporary Spin-on Glass Bonding Technologies for Via-Last/Backside-Via 3D Integration Using Multichip Self-Assembly"

Yuka Ito, Tohoku University

Paper: "Direct Multichip-to-Wafer 3D Integration Technology Using Flip-Chip Self-Assembly of NCF-Covered Known Good Dies"

Cui Huang, Tsinghua University

Paper: "Thermal and Electrical Tests of Air-Gap TSV"

Xu Chen, University of Illinois, Urbana-Champaign

Paper: "Optimal Relaxation of I/O Electrical Requirements under Packaging Uncertainty by Stochastic Methods"

Tengfei Jiang, University of Texas, Austin

Paper: "Effect of High Temperature Storage on the Stress and Reliability of 3D Stacked Chips"