InterPACK 2019: Program Overview

Tutorials | **Meals** | **Keynotes** | **Technical Sessions** | **Poster Session** | **Panels** | **Workshops** | **Meetings**

	7:00 AM - 7:45 AM	8:00 AM - 9:30 AM	9:30 AM - 10:30 AM	10:30 AM - 10:45 AM	10:45 AM - 12:15 PM	12:15 PM - 1:45 PM	1:45 PM - 3:15 PM	3:15 PM - 3:30 PM	3:30 PM - 5:00 PM	5:00 PM - 6:30 PM	6:30 PM - 7:30 PM	7:30 PM - 8:00 PM	8:00 PM - 8:30 PM	8:30 PM - 9:00 PM
Sunday, October 6											InterPACK Leadership Dinner (By Invitation)			
Monday, October 7	Authors' Breakfast *Pacific Ballroom C*	1-7 *Huntington A* 2-1 *Huntington B* 5-1 *Huntington C* 6-1 *Palos Verdes A* 8-2 *Palos Verdes B* 11-1 Suhir Tutorial *El Capitan A*	12-1 Masumi Sato: Sustainability of Commercial Printers *Pacific Ballroom A* 12--4 John Rogers: Soft Electronic and Microfluidic Systems for the Skin *Pacific Ballroom B*	Tea/Coffee Break *Pacific Ballroom Foyer*	1-3 *Huntington A* 2-2 *Huntington B* 5-2 *Huntington C* 6-2 *Palos Verdes A* 7-9 *Palos Verdes B* 8-4 *Redondo*	Lunch 12-8 InterPACK Achievement Award *Pacific Ballroom C*	1-4 *Huntington A* 2-3 *Huntington B* 5-3 *Huntington C* 6-3 *Palos Verdes A* 8-6 *Palos Verdes B* 13-5 Track 2 Panel *Malibu*	Tea/Coffee Break *Pacific Ballroom Foyer*	1-5 *Huntington A* 2-4 *Huntington B* 5-4 *Huntington C* 6-7 *Palos Verdes B* 7-4 *Palos Verdes A* 10-6 and 10-7 Heterogeneous Integration Roadmap (HIR) Workshop *Malibu*	10-2 Professional Development Workshop on Entrepreneurship *El Capitan A* 10-3 Professional Development Workshops on IP *El Capitan B*	Poster Session *Laguna* 14-1 K-16 Committee Meeting *Malibu*	14-2 EPPD Meeting *Executive Boardroom*		
Tuesday, October 8	Authors' Breakfast *Pacific Ballroom C*	2-5 *Huntington A* 4-1 *Huntington B* 5-5 *Huntington C* 6-6 *Palos Verdes A* 7-2 *Palos Verdes B* 11-2 Jain and Mukherjee Tutorial *El Capitan A*	12-2 Burak Ozpineci: Wired and Wireless Charging: Status, Challenges and Opportunities *Pacific Ballroom A* 12-6 Mohak Shah: Building Trust in AI Systems *Pacific Ballroom B*	Tea/Coffee Break *Pacific Ballroom Foyer*	2-6 *Huntington A* 4-6 *Huntington B* 5-6 *Huntington C* 6-4 *Palos Verdes A* 7-3 *Palos Verdes B* 13-2 Track 7 Panel *Santa Monica* 11-4 Luo Tutorial *El Capitan A*	Lunch 12-7 Allan Kraus Award *Pacific Ballroom C*	1-6 *Huntington A* 5-7 *Huntington B* 6-8 *Huntington C* 7-1 *Palos Verdes A* 8-5 *Palos Verdes B* 13-3 Women in Engineering *Malibu* 13-7 Track 4 Panel *Santa Monica*	Tea/Coffee Break *Pacific Ballroom Foyer*	5-8 *Huntington A* 6-9 *Huntington B* 6-10 *Huntington C* 7-6 *Palos Verdes A* 13-1 Track 1 Panel *Malibu* 13-4 Track 8 Panel *Santa Monica*	10-1 Introduction to Robotics, Self-Driving Cars, and AI Workshop *Avila A* 10-4 Professional Development Workshop on Communication *El Capitan B* 10-5 K-16 Professional Development Workshop on Mentoring *El Capitan A*	14-3 InterPACK Meeting (Open) *Malibu*	14-4 InterPACK Meeting (Advisory) *Santa Monica*	14-5 Journal of Electronic Packaging (JEP) Meeting *Malibu*	
Wednesday, October 9	Authors' Breakfast *Pacific Ballroom C*	1-2 *Huntington A* 4-3 *Huntington B* 5-9 *Huntington C* 6-5 *Palos Verdes B* 6-11 *Palos Verdes A* 11-3 Boteler Tutorial *El Capitan A*	12-3 John Bowers: High Speed, High Bandwidth Density, High Efficiency Optical Interconnects *Pacific Ballroom A* 12-5 Ravi Mahajan: Advanced Packaging for Heterogeneous Integration + Ceremony in Honor of Nasser Grayeli *Pacific Ballroom B*	Tea/Coffee Break *Pacific Ballroom Foyer*	1-8 *Huntington A* 4-4 *Huntington B* 6-12 *Huntington C* 7-7 *Palos Verdes A* 8-1 *Palos Verdes B* 13-6 Track 6 Panel *Santa Monica*	Lunch 12-9 InterPACK and Nasser Grayeli Poster, EPPD, and JEP Awards *Pacific Ballroom C*	2-7 *Palos Verdes B* 3-1 *Huntington A* 4-5 *Huntington B* 6-13 *Huntington C* 7-8 *Palos Verdes A*	Tea/Coffee Break *Pacific Ballroom Foyer*	4-2 *Huntington B* 6-14 *Huntington C* 6-15 *Palos Verdes A* 7-10 *Palos Verdes B* 8-7 *Redondo*					

Technical Sessions

Track 1: Heterogeneous Integration	Track 4: Flexible and Wearable Electronics	Track 6: Power Electronics	Track 7: Energy Conversion and Storage
1-2: Thermal Management Applications I	4-1: Design & Modeling for Flexible Electronics	6-1: Wide Bandgap Materials, Devices, and Circuits	7-1: Batteries, Supercapacitors, and Solar Cells I
1-3: Microfabrication	4-2: Microfluidics for Flexible Electronics	6-2: Ultra-Wide Bandgap Gallium Oxide Electronics	7-2: Thermal Management Optimization Strategies
1-4: Fundamentals of Thermal Transport	4-3: Flexible Electronics Packaging & Assembly	6-3: Device Thermal Management and Reliability	7-3: Phase-Change Cooling
1-5: Design and Characterization I	4-4: Interconnect Reliability in Flexible Systems	6-4: Metrology Techniques	7-4: Solid-State Cooling
1-6: Microsystems Packaging	4-5: Process Development and Characterization of Flexible Systems	6-5: High-Temperature Electronics Packaging	7-6: Batteries, Supercapacitors, and Solar Cells III
1-7: Design and Characterization II	4-6: FHE Design & Modeling Demonstrations	6-6: Power Electronics Packaging Reliability	7-7: Thermal Characterization
1-8: Thermal Management Applications II	**Track 5: Photonics and Optics**	6-7: Two-Phase Cooling	7-8: Thermal Switches and Thermal Metamaterials
Track 2: Servers of the Future, Edge and Cloud Computing	5-1: DUV-LED I	6-8: Microchannel Heat Sinks	7-9: Challenges and Opportunities in Thermal Management of Components and Systems
2-1: Data Center Cooling I	5-2: DUV-LED II	6-9: Phase Change Materials	
2-2: Two Phase Cooling I	5-3: Integrated Photonics and Wide Bandgap Photonics	6-10: Thermal Interface Materials	7-10: Batteries, Supercapacitors, and Solar Cells II
2-3: Two Phase Cooling II	5-4: Nanostructure/Flexible Materials & Devices	6-11: System-Level Thermal Design I	**Track 8: Autonomous, Hybrid, and Electric Vehicles**
2-4: Fundamental Cooling Technologies	5-5: Visible LED and its Application	6-12: System-Level Thermal Design II	8-1: ECU-Level Reliability
2-5: Data Center Cooling II	5-6: LED & OLED & Photo Device	6-13: System Integration	8-2: Electric/Hybrid Cars
2-6: Immersion Cooling I	5-7: Organic Materials and Devices	6-14: Additive Manufacturing	8-4: Material Modeling for Automotive Packaging I
2-7: Immersion Cooling II	5-8: Packaging and Thermal Management I	6-15: Emerging Technologies	8-5: Material Modeling for Automotive Packaging II
Track 3: Internet of Things	5-9: Packaging and Thermal Management II		8-6: Prognostics and Health Management of Automotive Electronics
3-1: IoT Applications			8-7: Reliability of Electronic Components for Harsh Environment

Panels
Women in Engineering
Track 1: Progressing or Not Progressing During Two Years of HIR
Track 2: System / Data Center Liquid Cooling
Track 4: Application Challenges in Flexible and Wearable Electronics
Track 6: Transient Thermal Management – Considering Thermal Capacitance and Not Just Thermal Resistance
Track 7: Extreme Fast Charging of Lithium-ion Batteries
Track 8: Reliability in the Age of AI: Opportunities and Challenges

Tutorials
Ephraim Suhir: Failure-Oriented-Accelerated-Testing (FOAT) vs. Highly-Accelerated-Life-Testing (HALT) in Making a Viable Electron Device/Package into a Reliable Product
Ankur Jain and Partha Mukherjee: Thermo-Electrochemical Coupling and Interactions in Li-ion Cells
Lauren Boteler: Army Research Laboratory ParaPower Tutorial
Fang Luo: A Review of Advanced Power Module Packaging and Thermal Management in WBG Era

Revised 9/30/2019

Technical Sessions

MONDAY, OCTOBER 7, 8:00AM–9:30AM

	8:00AM	8:20AM	8:40AM	9:00AM
1-7: Design and Characterization II Fourth Floor, Huntington A Session Organizers: **Shankar Narayanan,** *Rensselaer Polytechnic Institute,* **Shima Hajimirza**, *Texas A&M University*	**Fatigue Life of Sn3.0Ag0.5Cu Solder Alloys Under Combined Shear and Compressive Loads** (6507) Paper Publication **Travis Dale, Yuvraj Singh, Ian Bernander, Ganesh Subbarayan, Carol Handwerker,** *Purdue University,* **Peng Su, Bernard Glasauer,** *Juniper Networks*	**Strain Distribution in a Small Solder Specimen With Few Crystal Grains** (6546) Presentation Only **Toru Ikeda, Takumi Sasaki, Atushi Yanase,** *Kagoshima University,* **Dai Okumura,** *Nagoya University,* **Yoshiharu Kariya,** *Shibaura Institute of Technology,* **Masaaki Koganemaru,** *Kagoshima University*	**Medium to High Strain-Rate Characterization of Lead-Free Solder Alloys Through Metal Cutting Experiments** (6510) Paper Publication **Yuvraj Singh, Anirudh Udupa, Srinivasan Chandrasekar, Ganesh Subbarayan,** *Purdue University*	
2-1: Data Center Cooling I Fourth Floor, Huntington B Session Organizers: **Cheng Chen, Prakriti Choudhary,** *Facebook,* **Brent Goren,** *Eaton*	**Dynamic Control of Airflow Balance in Data Centers** (6304) Paper Publication **Stephen Linder, Jim VanGilder, Yan Zhang,** *Schneider-Electric,* **Enda Barrett,** *National University of Ireland Galway*	**Thermal Profiling of a Small Operational Data Center** (6309) Paper Publication **Ismail Turkmen, Cem Ahmet Mercan, Hamza Salih Erden,** *Istanbul Technical University*	**Feedback Control System for Airflow Management in Data Centers Using Active Air Dampers** (6430) Presentation Only **Ghazal Mohsenian, Sadegh Khalili, Bahgat Sammakia,** *Binghamton University*	**Thermal Challenges in Servers** (6532) Presentation Only **Timothy Chainer, Mark Schultz, Pritish Parida,** *IBM*
5-1: DUV-LED I Fourth Floor, Huntington C Session Organizers: **Yuji Zhao,** *Arizona State University,* **Jonathan Klamkin,** *University of California, Santa Barbara*	**AlGaN Nanowire Light Emitting Diodes on Metal Substrates** (6322) Presentation Only **Haiding Sun,** *University of Science and Technology of China*	**Large Roll Hexagonal BN Monolayer: Synthesis, Modulation Doping, and 2D Emitter** (6326) Presentation Only **Duanjun Cai, Guozhen Liu, Yuejin Wang,** *Xiamen University*	**Polarization Engineering of III-Nitride Photonic Devices** (6370) Presentation Only **Cheng Liu, Jing Zhang,** *Rochester Institute of Technology*	**Recent Progress on the Development of III-Nitride based DUV Light-Emitting Diodes and Micro-/Nano-Structured Light Emitting Diodes** (6310) Presentation Only **Zi-Hui Zhang, Yonghui Zhang, Kangkai Tian, Chunshuang Chu, Jiamang Che, Hua Shao, Jianquan Kou, Xu Hou,** *Hebei University of Technology*
6-1: Wide Bandgap Materials, Devices, and Circuits Fourth Floor, Palos Verdes A Session Organizers: **Jae-Hyun Ryou,** *University of Houston,* **Richard Thomas,** *U.S. Army Research Laboratory,* **Anil Yuksel,** *IBM*	**Radiation Effects on the Self-Heating of AlGaN/GaN HEMTs** (6438) Presentation Only **Bikramjit Chatterjee, Yiwen Song, Brian Foley, Sukwon Choi,** *Pennsylvania State University,* **Hyungtak Kim,** *Hongik University*	**Piezoresistive Theory for 4H Silicon Carbide Stress Sensors on Four-Degree Off-Axis Wafers** (6461) Paper Publication **Jun Chen, Richard Jaeger, Jeffrey Suhling,** *Auburn University*	**The Doping Dependence of the Thermal Conductivity of Bulk Gallium Nitride Synthesized via Diverse Growth Techniques** (6528) Presentation Only **Yiwen Song, Bikramjit Chatterjee, Brian Foley, Sukwon Choi,** *Pennsylvania State University,* **Weijie Wang, Jae-Hyun Ryou,** *University of Houston,* **Jacob Leach,** *Kyma Technologies,* **Srabanti Chowdhury,** *Stanford University*	**Design, Analysis, and Comparison of Insulated Metal Substrates for High Power Wide-Bandgap Power Modules** (6436) Paper Publication **Emre Gurpinar, Burak Ozpineci, Shajjad Chodhury,** *Oak Ridge National Laboratory*
8-2: Electric/Hybrid Cars Fourth Floor, Palos Verdes B Session Organizers: **Azeem Sarwar,** *General Motors,* **Przemyslaw Jakub Gromala,** *Bosch*	**System-level Thermal Management and Reliability of Automotive Electronics: Goals and Opportunities in the Next Generation of Electric and Hybrid Electric Vehicles** (6429) Paper Publication **Bakhtiyar Mohammad Nafis, David Huitink, Ange-Christian Iradukunda, Yarui Peng, Imam Al Razi,** *University of Arkansas*	**Experimentation and Simulation of Jet Impingement Cooling of Electric Machines With Automatic Transmission Fluid** (6445) Presentation Only **Xuhui Feng, Kevin Bennion, J. Emily Cousineau, Gilberto Moreno, Bidzina Kekelia, Sreekant Narumanchi, Jeff Tomerlin,** *National Renewable Energy Laboratory*	**Thermal Management of Fast Charging Systems for Electrified Vehicles** (6660) Presentation Only **Yashraj Gurumukhi, Muhammad Jahidul Hoque, Andrew Alleyne, Nenad Milijkovic,** *University of Illinois at Urbana-Champaign,* **Hansen Qiao, Kenneth Goodson, Mehdi Asheghi,** *Stanford University,* **Myung Ki Sung, Xi Lu, Ted Fillipi,** *Ford Motor Company*	**Surface Temperature Effect on Convective Heat Transfer Coefficients for Jet Impingement Cooling of Electric Machines With Automatic Transmission Fluid** (6457) Paper Publication **Bidzina Kekelia, Kevin Bennion, Xuhui Feng, Gilberto Moreno, J. Emily Cousineau, Sreekant Narumanchi, Jeff Tomerlin,** *National Renewable Energy Laboratory*

Technical Sessions

MONDAY, OCTOBER 7, 10:45AM–12:15PM

	10:45AM	11:05AM	11:25AM	11:45AM
1-3: Microfabrication Fourth Floor, Huntington A Session Organizers: **Tuhin Sinha**, *IBM,* **Shima Hajimirza**, *Texas A&M University*	**CFD Analysis of Molten Solder Flow Behavior and Bridging Mechanism During Solder Bump Formation** (6395) Paper Publication **Risa Miyazawa, Keishi Okamoto, Hiroyuki Mori,** *IBM*	**Numerical/Experimental Hybrid Approach to Predict Warpage of Thin Substrates** (6420) Presentation Only **Sukrut Prashant Phansalkar, Bongtae Han,** *University of Maryland,* **Jongkeun Moon,** *Samsung Electronics*	**Addressing the Challenges in Laser Micro-Machining and Bonding of Silicon Microchannel Cold-Plate and 3D-Manifold for Embedded Cooling Applications: Perfect Debris Removal** (6539) Paper Publication **Sougata Hazra, Ki Wook Jung, Mehdi Asheghi, Kenneth Goodson,** *Stanford,* **Madhusudan Iyengar, Chris Malone,** *Google*	
2-2: Two Phase Cooling I Fourth Floor, Huntington B Session Organizers: **Emad A. Poshtan,** *Bosch,* **Mark Schultz,** *IBM*	**An Experimental Investigation on the Fluid Distribution in a Two-Phase Cooled Rack Under Steady and Transient IT Load** (6463) Paper Publication **Sadegh Khalili, Srikanth Rangarajan, Bahgat Sammakia** *Binghamton University,* **Vadim Gektin,** *Futurewei Technologies*		**Design of Passive Two-Phase Thermosyphons for Server Cooling** (6386) Paper Publication **Raffaele L. Amalfi,** *Nokia Bell Labs,* **Jackson B. Marcinichen,** *JJ Cooling Innovation,* **John R. Thome,** *Ecole Polytechnique Federale de Lausanne,* **Filippo F. Cataldo,** *Provides Metalmeccanica S.r.l.*	
5-2: DUV-LED II Fourth Floor, Huntington C Session Organizers: **Zi-Hui Zhang,** *Hebei University of Technology,* **Haiding Sun,** *University of Science and Technology of China*	**III-Nitride UV-Visible Integrated Photonics for Quantum and Biomedical Applications** (6323) Presentation Only **Yuji Zhao,** *Arizona State University*	**Improvement of DUV LEDs Light Extraction Efficiency by Novel Microstructures** (6340) Presentation Only **Changqing Chen, Shuang Zhang, Shuai Wang, Jun Zhang, Hanling Long, Qian Chen, Jiangnan Dai,** *Huazhong University of Science and Technology*	**Strain Effect on AlGaN Anisotropic Ultraviolet Light Emitting Characteristic** (6341) Presentation Only **Hanling Long, Linlin Xu, Jiangnan Dai, Changqing Chen,** *Huazhong University of Science and Technology*	**Photonic Engineering in AlGaN-Based Deep Ultraviolet Devices: Symmetry, Strain and Polarization** (6357) Presentation Only **Shiqiang Lu, Wei Lin, Shuping Li, Junyong Kang, Duanjun Cai,** *Xiamen University*
6-2: Ultra-Wide Bandgap Gallium Oxide Electronics Fourth Floor, Palos Verdes A Session Organizers: **Jungwan Cho,** *Kyunghee University,* **Mandar Kulkarni,** *Amazon*	**Electrothermal Modeling and Analysis of Gallium Oxide Power Switching Devices** (6453) Paper Publication **Ramchandra Kotecha, Andriy Zakutayev, Wyatt Metzger, Paul Paret, Gilbert Moreno, Bidzina Kekelia, Kevin Bennion, Barry Mather, Sreekant Narumanchi,** *National Renewable Energy Laboratory,* **Samuel Kim, Samuel Graham,** *Georgia Tech*	**Thermal Management of Beta–Ga_2O_3 Transistors** (6728) Presentation Only **Samuel Kim, Chao Yuan, Jingjing Shi, Samuel Graham,** *Georgia Tech*	**Thermal Management of Gallium Oxide Electronics via Hetero-Integration on High Thermal Conductivity Substrates** (6439) Presentation Only **Bikramjit Chatterjee, Yiwen Song, Zahabul Islam, Aman Haque, Brian Foley, Sukwon Choi,** *Pennsylvania State University,* **Craig McGray,** *Modern Microsystems,* **Jacob Leach,** *Kyma Technologies*	**Surface-Pretreatment-Dependent High Thermal Boundary Conductance Across Heterogeneous Atomic-Layer-Deposited Ga_2O_3-Diamond Interfaces** (6608) Presentation Only **Zhe Cheng, Jingjing Shi, Luke Yates, Samuel Graham,** *Georgia Tech,* **Virginia Wheeler, Marko Tadjer, Karl Hobart,** *U.S. Naval Research Laboratory,* **Tingyu Bai, Mark Goorsky,** *University of California, Los Angeles*
7-9: Challenges and Opportunities in Thermal Management of Components and Systems Fourth Floor, Palos Verdes B Session Organizers: **Aritra Sur,** *United Technologies Research Center,* **Ayyoub Momem,** *Oak Ridge National Laboratory*	**Challenges and Opportunities in Thermal Management of Directed Energy Systems** (6625) Technical Presentation Only **Avram Bar-Cohen,** *DARPA,* **Terry G. DuBois,** *U.S. Army Futures Command*		**Measuring Junction Temperature of LEDs: Challenges and Opportunities** (6776) Technical Presentation Only **Mehmet Arik,** *Ozyegin University*	
8-4: Material Modeling for Automotive Packaging I Fourth Floor, Redondo Session Organizers: **Xuhui Feng,** *National Renewable Energy Laboratory,* **Klas Brinkfeldt,** *RISE IVF*	**Study of Thermal Aging Behavior of Epoxy Molding Compound for Applications in Harsh Environments** (6506) Presentation Only **Przemyslaw Jakub Gromala, Adwait Inamdar, Alexandru Prisacaru,** *Bosch,* **Bongtae Han,** *University of Maryland*	**Fatigue Delamination Crack Growth of Potting Compounds in PCB/Epoxy Interfaces Under Flexure Loading** (6572) Paper Publication **Pradeep Lall, Kalyan Dornala, Jeffrey Suhling,** *Auburn University,* **John Deep,** *U.S. Air Force Research Laboratory,* **Ryan Lowe,** *ARA Associates*	**Moisture Transport Through Housing Materials Enclosing Critical Automotive Electronics** (6621) Presentation Only **Artur Roman, Bongtae Han,** *University of Maryland*	**Evolution of the Microstructure of Lead Free Solders Subjected to Both Aging and Cyclic Loading** (6560) Paper Publication **Md. Mahmudur Chowdhury, Mohd Aminul Hoque, Jeffrey Suhling, Sa'd Hamasha, Pradeep Lall,** *Auburn University*

Technical Sessions

MONDAY, OCTOBER 7, 1:45PM–3:15PM

	1:45PM	2:05PM	2:25PM	2:45PM
1-4: Fundamentals of Thermal Transport Fourth Floor, Huntington A Session Organizers: **Nirup Nagabandi**, *Incendium Technologies,* **Yuling Niu**, *Binghamton University*	**Boiling Heat Transfer Using Spatially-Variant and Uniform Microporous Coatings** (6307) Paper Publication **Quang Pham, Youngjoon Suh, Bowen Shao, Yoonjin Won,** *University of California, Irvine*	**Effect of Inclined Angle of Heat Sink on Natural Convective Heat Dissipation Performance** (6313) Paper Publication **Tengfei Ma, Wen Wang,** *Shanghai Jiao Tong University*	**Ultrahigh Thermal Boundary Conductance Across GaN-SiC Heterogeneous Interfaces by Surface Activated Bonding** (6607) Presentation Only **Zhe Cheng, Samuel Graham,** *Georgia Tech,* **Fengwen Mu, Tadatomo Suga,** *University of Tokyo*	**Demonstration of 150-micron Ultrathin Vapor Chambers for 5G Smartphones** (6683) Presentation Only **Ryan Lewis,** *Kelvin Thermal Technologies,* **Yung Cheng Lee,** *University of Colorado, Boulder*
2-3: Two Phase Cooling II Fourth Floor, Huntington B Session Organizers: **Emad Poshtan,** *Bosch,* **Mark Schultz,** *IBM*	**The Critical Role of Dynamic Surface Wettability on Bubble Dynamics and Boiling Performance** (6308) Presentation Only **Taylor Allred, Justin Weibel,** *Purdue University,* **Suresh Garimella,** *University of Vermont*	**On Temperature Discontinuity at an Evaporating Liquid-Vapor Interface** (6346) Presentation Only **Parham Jafari, Hadi Ghasemi,** *University of Houston*	**Capillary Evaporation in Graphene-Coated Nanochannels** (6428) Presentation Only **Hadi Ghasemi, Masoumeh Nazari,** *University of Houston*	**Enabling Thermal Management of High-Powered Server Processors Using Passive Thermosiphon Heat Sink** (6530) Paper Publication **Devdatta Kulkarni, Priyanka Tunuguntla, Guixiang Tan, Casey Carte,** *Intel*
5-3: Integrated Photonics and Wide Bandgap Photonics Fourth Floor, Huntington C Session Organizers: **Jing Zhang,** *Rochester Institute of Technology,* **Bin Liu,** *Nanjing University*	**On-Chip Detection From Directly Modulated Quantum Dot Microring Lasers on Si** (6352) Presentation Only **Yating Wan,** *University of California, Santa Barbara*	**High-Gain Solid-State Photomultiplier Based on Periodic GaN/AlN Hetero-Structures** (6371) Presentation Only **Lai Wang, Xingzhao Wu, Zhibiao Hao, Yi Luo, Changzheng Sun, Bing Xiong, Yanjun Han, Jian Wang, Hongtao Li,** *Tsinghua University,* **Julien Brault, Mohamed Al Khalfioui, Maud Nemoz,** *CNRS*	**Laser Integration Technologies for Silicon Photonics** (6610) Presentation Only **Jonathan Klamkin,** *University of California, Santa Barbara*	**Improving Performance and Reliability of GaN-Based Flip-Chip Light Emitting Diodes by Reflective Bonding Pads** (6337) Presentation Only **Linlin Xu, Hanling Long, Jiangnan Dai, Changqing Chen,** *Huazhong University of Science and Technology*
6-3: Device Thermal Management and Reliability Fourth Floor, Palos Verdes A Session Organizers: **Shubhodeep Goswami,** *General Electric,* **Lauren Kegley,** *Cree Wolfspeed*	**Degradation Modeling and Reliability Assessment of Capacitors** (6456) Paper Publication **Anunay Gupta, Om Prakash Yadav, Arighna Roy,** *North Dakota State University,* **Douglas DeVoto, Joshua Major,** *National Renewable Energy Laboratory*	**Thermal Assessment and In-Situ Monitoring of Insulated Gate Bipolar Transistors in Power Electronic Modules** (6470) Paper Publication **Erick Gutierrez, Kevin Lin, Patrick McCluskey,** *University of Maryland,* **Douglas DeVoto,** *National Renewable Energy Laboratory*	**The Effect of Anisotropy on Thermal Boundary Conductance at Metal-Semiconductor Interface** (6748) Presentation Only **Jingjing Shi, Zhe Cheng, Chao Yuan, Samuel Graham,** *Georgia Tech*	**Integrated Optical Probing of the Thermal Dynamics of Wide Bandgap Power Electronics** (6440) Paper Publication **James Lundh, Yiwen Song, Bikramjit Chatterjee, Sukwon Choi,** *Pennsylvania State University,* **Albert Baca, Robert Kaplar, Andrew Armstrong, Andrew Allerman,** *Sandia National Laboratory*
8-6: Prognostics and Health Management of Automotive Electronics Fourth Floor, Palos Verdes B Session Organizers: **Przemyslaw Jakub Gromala,** *Bosch,* **Bongtae Han,** *University of Maryland*	**Silicon-Based Piezoresistive Stress Sensor as a Load Counter for Automotive Electronic Systems** (6419) Presentation Only **Yu-Hsiang Yang, Bongtae Han,** *University of Maryland*	**Data-Driven Approaches for Fault Prognosis of SiC MOSFETs** (6524) Presentation Only **Weiqiang Chen, Lingyi Zhang, Ali Bazzi, Krishna Pattipati,** *University of Connecticut,* **Shalesh Joshi, Ercan Dede,** *Toyota*	**Prognostication of Failure in Packaged Power Devices for Automotive Applications** (6487) Presentation Only **Andreas Lövberg, Klas Brinkfeldt, Jerry Börjesson, Dag Andersson,** *RISE IVF*	**Stator Diagnosis in Permanent Magnet Synchronous Motor** (6423) Paper Publication **Madi Zholbaryssov,** *University of Illinois at Urbana-Champaign,* **Azeem Sarwar,** *General Motors*

Technical Sessions

MONDAY, OCTOBER 7, 3:30PM–5:00PM

	3:30PM	3:50PM	4:10PM	4:30PM
1-5: Design and Characterization I Fourth Floor, Huntington A Session Organizers: **Sandeep Mallampati**, *Global Foundries,* **Fabian Welschinger**, *Bosch*	**The Assembly Solutions for Heterogeneous Integration Packaging Technology for High Performance Computing** (6450) Presentation Only **Bo-Hao Ma, Chich Sheng Lin, Nicholas Kao, Daniel Ng, Yu Po Wang,** *Siliconware Precision Industries*	**Effect of Nonlinear Response of Printed Circuit Boards (PCBs) Under Multiaxial Vibration Excitation** (6369) Presentation Only **Abhijit Dasgupta,** *University of Maryland*	**Time-Dependent Behavior of Epoxy Molding Compound Subjected to Hydrostatic Loading: Characterization and Its Effect on Reliability Assessment** (6441) Presentation Only **Hyun Seop Lee, Sukrut Prashant Phansalkar, Bongtae Han,** *University of Maryland*	**Design-for-Reliability of Solder Joint Interconnections in Aerospace Electronics** (6318) Presentation Only **Ephraim Suhir,** *Portland State University*
2-4: Fundamental Cooling Technologies Fourth Floor, Huntington B Session Organizers: **Jimil M. Shah,** *University of Texas at Arlington,* **Pavan Rajmane,** *Qualcomm,* **Sterve Moon,** *3M*	**Demonstration of a Compliant Micro-Spring Array as a Thermal Interface Material for Pluggable Optoelectronic Transceiver Modules** (6389) Paper Publication **Jin Cui, Liang Pan, Justin Weibel,** *Purdue University*	**Investigation Regarding Transient Compact Thermal Model for Microprocessor Packages** (6390) Paper Publication **Koji Nishi,** *Japan/Ashikaga University*	**Thermal and Mechanical Design of the Fastest Supercomputer of the World in Cognitive Systems: IBM POWER AC 922** (6444) Paper Publication **Anil Yuksel, Vic Mahaney, Chris Marroquin, Shurong Tian, Mark Hoffmeyer, Mark Schultz, Todd Takken,** *IBM*	**Comparative Evaluation of Algorithms for Achieving Ultrapacked Thermal Greases: Microstructural Models and Effective Behavior** (6501) Paper Publication **Sukshitha Achar Puttur Lakshminarayana, Huanyu Liao, Ganesh Subbarayan,** *Purdue University*
5-4: Nanostructures/ Flexible Materials and Devices Fourth Floor, Huntington C Session Organizers: **Junyou Pan,** *Guangzhou ChinaRay Optoelectronic Materials,* **Klaus Müllen,** *Max-Planck Institute for Polymer Research*	**Barcode-Like Security Labels Based on Flexible and Ultra-Lightweight Polymer Membrane Lasers** (6431) Presentation Only **Malte Gather,** *University of St. Andrews*	**Near-Field Infrared Imaging of Hot Electrons in Nano-Devices** (6330) Presentation Only **Zhenghua An,** *Fudan University*	**Design of Diffractive Beam Splitters by Indirect Construction of Diffraction Pattern Based on Sampling Theory** (6338) Presentation Only **Hui Xiong,** *Hubei University*	**Direct Ink Printing of Cavities in DPC Ceramic Substrates With Kaolin Pastes for Hermetic Packaging** (6616) Paper Publication **Qinglei Sun, Yang Peng, Hwo Cheng, Yun Mou, Mingxiang Chen,** *Huazhong University of Science and Technology*
6-7: Two-Phase Cooling Fourth Floor, Palos Verdes B Session Organizers: **Ruander Cardenas,** *Intel,* **Franklin Robinson,** *NASA Goddard Space Flight Center*	**Two-Phase Immersion Cooling of a SiC on-Vehicle Inverter by Self-Cooling Effect Using Lotus Porous Coppers** (6494) Presentation Only **Tsuji Rikako, Kazuhisa Yuki, Kio Takai, Risako Kibushi, Noriyuki Unno,** *Sanyo-Onoda City University,* **Takuya Ide Tetsuro Ogushi, Masaaki Murakami, Tomiyuki Numata,** *Lotus Thermal Solution,* **Hikaru Nomura,** *Osaka University*	**Gravity Effects in Two-Phase Microgap Flow** (6745) Presentation Only **Franklin Robinson,** *NASA Goddard Space Flight Center,* **Avram Bar-Cohen,** *University of Maryland*	**Moving Boundary Model for Dynamic Control of Two Microchannel Evaporator Cooling System** (6760) Presentation Only **Qi Jin, John T. Wen, Shankar Narayanan,** *Rensselaer Polytechnic Institute*	**Assessing the Performance of Advanced Cooling Techniques on Thermal Management of Next-Generation Power Electronics** (6311) Paper Publication **Palash Acharya, Vaibhav Bahadur, Robert Hebner, Abdelhamid Ouroua, Shannon Strank,** *University of Texas at Austin*
7-4: Solid-State Cooling Fourth Floor, Palos Verdes A Session Organizers: **Michael Benedict,** *Palo Alto Research Center,* **Aritra Sur,** *United Technologies Research Center*	**Performance of an Electrocaloric Heat Pump Device** (6558) Presentation Only **Subramanyaravi Annapragada, Aritra Sur, Joseph Mantese, William Rioux,** *United Technologies Research Center*		**Magnetocaloric Refrigeration** (6623) Presentation Only **Ayyoub Momem,** *Oak Ridge National Laboratory*	

Technical Sessions

TUESDAY, OCTOBER 8, 8:00AM–9:30AM

	8:00AM	8:20AM	8:40AM	9:00AM
2-5: Data Center Cooling II Fourth Floor, Huntington A Session Organizers: **Prakriti Choudhary, Cheng Chen,** *Facebook,* **Brent Goren**, *Eaton*	**Optimal Design and Modeling of Server Cabinets With In-Row Coolers and Air Conditioning Units in a Modular Data Center** (6522) Paper Publication **Uschas Chowdhury, Ankit Sutaria, Dereje Agonafer,** *University of Texas at Arlington,* **Mark Hendrix, Thomas Craft, Willis James,** *CommScope*	**Comparison of Data Driven Modeling Approaches for Temperature Prediction in Data Centers** (6565) Presentation Only **Jayati Athavale,** *Facebook,* **Yogendra Joshi, Minami Yoda,** *Georgia Tech*	**Data Center Thermal Efficiency Improvement by Cooling Flow Vectoring Using Synthetic Jets** (6585) Paper Publication **Eduardo Sepúlveda Jiménez, Jean Paul D'alençon, Luis Silva-Llanca,** *Universidad de La Serena*	**Development of a Technique to Measure Deliquescent Relative Humidity of Particulate Contaminants and Determination of the Operating Relative Humidity of a Data Center** (6601) Paper Publication **Jimil M. Shah, Roshan Anand, Satyam Saini, Rawhan Cyriac, Dereje Agonafer,** *University of Texas at Arlington,* **Prabjit Singh,** *IBM,* **Mike Kaler,** *Mestek*
4-1: Design & Modeling for Flexible Electronics Fourth Floor, Huntington B Session Organizers: **Philip Buskohl,** *U.S. Air Force Research Laboratory,* **Tsung-Ching Jim Huang,** *Hewlett Packard Labs*	**Mechanical and Electrical Modeling and Characterization of Flexible Printed Electronic Elements** (6498) Presentation Only **Rui Chen, Yi Zhou, Sridhar Sivapurapu, Nahid A. Amoli, Mohamed Bellaredj, Justin Chow, Madhavan Swaminathan, Suresh Sitaraman,** *Georgia Tech,* **Tsung-Ching Jim Huang,** *Hewlett Packard Labs*	**Design Tools and FHE Materials for Physically Reconfigurable RF Platforms** (6750) Presentation Only **Philip Buskohl**, *Air Force Research Laboratory*	**Bounding the Problem** (6764) Presentation Only **James Chew,** *Cadence Design Systems*	**Applying Multi-Physics Analysis and Data Analytics for IIoT Applications With FHE** (6755) Invited Presentation **Norman Chang,** *ANSYS*
5-5: Visible LED and its Applications Fourth Floor, Huntington C Session Organizers: **Changqing Chen,** *Huazhong University of Science and Technology,* **Lai Wang,** *Tsinghua University*	**Red InGaN LEDs Grown by Micro-Flow Channel MOVPE** (6362) Presentation Only **Kazuhiro Ohkawa, Daisuke Iida,** *King Abdullah University of Science and Technology*	**Hybrid Nitride-Based Micro/Nano-LEDs With Quantum Dots for High Performance RGB/White Emissions** (6406) Presentation Only **Bin Liu,** *Nanjing University*	**GaN White Lasers and III-Nitride Integrated Photonics for Visible Light Communications** (6488) Presentation Only **Chao Shen,** *SaNoor Technologies*	**Making a Viable Electronic or a Photonic Device Into a Reliable Product: Application of the Probabilistic Design for Reliability Concept** (6301) Presentation Only **Ephraim Suhir,** *Portland State University*
6-6: Power Electronics Packaging Reliability Fourth Floor, Palos Verdes A Session Organizers: **Fang Luo,** *University of Arkansas,* **Pedro Quintero,** *University of Puerto Rico at Mayaguez*	**Numerical Investigation on Electromigration Oriented Failure of Lead-Free Solder Joints With Aging Effects** (6521) Paper Publication **Tusher Ahmed, Mohammad Motalab,** *Bangladesh University of Engineering and Technology,* **Jeffrey Suhling,** *Auburn University*	**Analysis of Thermal Stress in High Temperature Transient Liquid Phase Bonding of Power Electronics** (6525) Presentation Only **Yanghe Liu, Shailesh N. Joshi, Ercan Dede,** *Toyota*	**A Reliability Study of Silicon Carbide Power Modules Using POL-kW Packaging Technology** (6531) Presentation Only **Liang Yin, Christopher Kapusta, Arun Gowda, David Esler, Kaustubh Nagarkar, Risto Tuominen, Richard Eddins, Liqiang Yang, Robert George,** *General Electric*	**Thermomechanical Stress and Warpage Augmentation Using Auxetic Features in Electronic Design** (6424) Paper Publication **Mahsa Montazeri, John Harris, David Huitink, Adithya Venkatanarayanan, Simon Ang,** *University of Arkansas*
7-2: Thermal Management Optimization Strategies Fourth Floor, Palos Verdes B Session Organizers: **Menglong Hao,** *University of California, Berkeley,* **Sean Lubner,** *Lawrence Berkeley National Laboratory*	**A Statistical Study to Evaluate the Performance of Liquid Cooling Garments Considering Thermal Comfort** (6325) Paper Publication **Weicheng Shu, Jiawen Wang, Xinfeng Zhang, Xiaobing Luo,** *Hauzhong University of Science and Technology*	**Analysis of Channel Layout of a Pulsating Heat Pipe using Topology Optimization** (6360) Presentation Only **Jonghyun Lim, Sung Jin Kim,** *Korea Advanced Institute of Science and Technology*	**Development and Optimization of Control Strategy for a Dynamic Cold Plate to Save Pumping Power and Increase the Reliability** (6536) Presentation Only **Rajesh Kasukurthy, Amrutha Valli Rachakonda, Dereje Agonafer,** *University of Texas at Arlington*	**Thermal Management of a Highly Optimized Power Dense Non-Rare Earth Permanent Magnet Based Electric Traction Motor** (6566) Presentation Only **Aritra Sur, Zhentao Du, Robert H. Dold, Jagadeesh K. Tangudu,** *United Technologies Research Center*

Technical Sessions

TUESDAY, OCTOBER 8, 10:45AM–12:15PM

	10:45AM	11:05AM	11:25AM	11:45AM
2-6: Immersion Cooling I Fourth Floor, Huntington A Session Organizers: **Nikhil Lakhkar**, *Emerson Climate Technologies,* **Steve Moon**, *3M*	**Experimental Analysis for Optimization of Thermal Performance of a Server in Single Phase Immersion Cooling** (6590) Paper Publication **Pravin Shinde, Pratik Bansode, Satyam Saini, Rajesh Kasukurthy, Tushar Chauhan, Jimil M. Shah, Dereje Agonafer,** *University of Texas at Arlington*	**CFD Analysis of Thermal Shadowing and Optimization of Heatsinks in Third-Generation Open Compute Server for Single-Phase Immersion Cooling** (6600) Paper Publication **Jimil M. Shah, Ravya Dandamudi, Chinmay Bhatt, Pranavi Rachamreddy, Pratik Bansode, Dereje Agonafer,** *University of Texas at Arlington*	**Viability of Two Phase Immersion Cooling by Performing Thermal Testing Vehicle Experiments Using Enhanced Boilers** (6604) Presentation Only **Jimil M. Shah,** *University of Texas at Arlington*	
4-6: FHE Design & Modeling Demonstrations Fourth Floor, Huntington B Session Organizers: **Tsung-Ching Jim Huang,** *Hewlett Packard Labs,* **Philip Buskohl,** *Air Force Research Laboratory*	**Flexible Hybrid Electronics Process Design Kit (FHE-PDK)** (6756) Invited Presentation **Tsung-Ching Jim Huang,** *Hewlett Packard Labs*	**Manufacturing Process Driven Design (MPDD) for Improved Flexible Hybrid Electronic Design** (6768) Invited Presentation **Kris Hill,** *International TechneGroup*	**EDA Design and Analysis Methodology for Flexible Circuits** (6759) Presentation Only **John Carney, James Chew, John Park,** *Cadence Design Systems*	**Digital Qualification of Flexible and Wearable Electronics** (6767) Invited Presentation **Ian Campbell,** *OnScale*
5-6: LED, OLED and Photo Devices Fourth Floor, Huntington C Session Organizers: **Zhenghua An,** *Fudan University,* **Chao Shen,** *SaNoor Technologies*	**Printed OLED Display and Soluble Materials** (6374) Presentation Only **Junyou Pan, Jiahui Tan, Xi Yang, Yusheng Chen,** *Guangzhou ChinaRay Optoelectronic Materials*	**On the Development of Beta-Ga_2O_3-Based High-Performance Solar-Blind Photodetectors** (6414) Presentation Only **Yunbin He, Qile Wang, Mingkai Li,** *Hubei University*	**Correlated Effects of Self-Heating, Light Output, and Efficiency of GaN Light-Emitting Diodes on Junction Temperature** (6426) Paper Publication **Bikramjit Chatterjee, James S. Lundh, Daniel Shoemaker, Sukwon Choi,** *Pennsylvania State University,* **Tae Kyoung Kim, Joon Seop Kwak,** *Sunchon National University,* **Jaehee Cho,** *Chonbuk National University*	**High Performance Nonplar M-Plane InGaN Multiple-Quantum-Well Solar Cells With Improved Carrier Collection and High Temperature Spectral Response** (6335) Presentation Only **Xuanqi Huang, Houqiang Fu, Yuji Zhao,** *Arizona State University*
6-4: Metrology Techniques Fourth Floor, Palos Verdes A Session Organizers: **Ronald Warzoha,** *U.S. Naval Academy,* **Brian Foley,** *Pennsylvania State University*	**Evaporation Rate Measurement at Multiple Scales Using Temperature-Sensitive Fluorescence Dyes** (6372) Paper Publication **Youngjoon Suh, Cheng-Hui Lin, Hamsa Gowda, Yoonjin Won,** *University of California, Irvine*	**Advances in Nanoscale Thermoreflectance Thermal Imaging Calibration** (6425) Presentation Only **Kazuaki Yazawa, Dustin Kendig,** *Microsanj,* **Ali Shakouri,** *Purdue University*	**Application of X-Ray CT Images and Phase-Shifted Sampling Moiré Method to Residual Strain Measurement in Electronic Packages** (6486) Presentation Only **Masaaki Koganemaru, Sho Nagato, Toru Ikeda,** *Kagoshima University,* **Masakazu Uchino,** *Fukuoka Industrial Technology Center*	**Thermoreflectance Imaging of Electromigration in Aluminum Interconnects at Different Ambient Temperatures** (6413) Paper Publication **Sami Alajlouni, Kerry Maize, Peter Bermel, Ali Shakouri,** *Purdue University*
7-3: Phase-Change Cooling Fourth Floor, Palos Verdes B Session Organizers: **Marc Dunham,** *3M,* **Kyle Gluesenkamp,** *Oak Ridge National Laboratory*	**Mechanical Properties of Polyethylene Based Heat Storage Composite Containing Phase Change Material and Copper Sheet** (6464) Presentation Only **Kohei Fukuchi, Kenichi Ohguchi, Kengo Kurosawa, Yuuki Sugimoto,** *Akita University,* **Katsuhiko Sasaki,** *Hokkaiido University*	**Characterizing Dynamic Response of Phase Change Materials** (6656) Presentation Only **Alison Hoe, Patrick Shamberger,** *Texas A&M University,* **Michael Barako,** *Northrop Grumman*	**Evaporation of Microdroplet Suspended on Porous Micropillar Structure: The Effect of Micropillar Height on Transport Performance** (6465) Presentation Only **Junhui Li, Li Shan, Binjian Ma, Runzhi Zhang, Damena Agonafer,** *Washington University in St. Louis,* **Baris Dogruoz,** *Cisco Systems*	**Molecular Dynamics Simulation of Thin-Film Evaporation From Nanocoated Surfaces: The Asymptotic Relationship Between Evaporation Rate and Nanocoating Thickness** (6466) Presentation Only **Binjian Ma, Rui Zhou, Li Shan, Junhui Li, Damena Agonafer,** *Washington University in St. Louis,* **Baris Dogruoz,** *Cisco Systems*

Technical Sessions

TUESDAY, OCTOBER 8, 1:45PM–3:15PM

	1:45PM	2:05PM	2:25PM	2:45PM
1-6: Microsystems Packaging Fourth Floor, Huntington A Session Organizers: **Subhasis Mukherjee**, *Apple,* **Subramanyaravi Annapragada**, *United Technologies Research Center*	**Double Side System in Package Development Challenge for Heterogeneous Integration** (6354) Paper Publication **Feng Kao, Yu Po Wang, Davidlion Wang, Jensen Tsai, Mike Tsai, Ryan Chiu, Eric He,** *Silliconware Precision Industries*	**Performance Analysis and Shape Optimization of Manifold in Liquid-Cooled Parallel Micro-Channel Heat Sinks** (6455) Presentation Only **Yaser Hadad, Cong Hoang, Srikanth Rangarajan, Paul R. Chiarot, Bahgat Sammakia,** *Binghamton University*	**Minimizing the Effects of On-Chip Hot-Spots Using Multi-Objective Optimization of Flow Distribution in Water-Cooled Parallel Micro-Channel Heat Sinks** (6459) Presentation Only **Yaser Hadad, Vahideh Radmard, Mahdi Farahikia, Paul R. Chiarot, Bahgat Sammakia,** *Binghamton University*	**High Strain Rate Mechanical Properties of SAC-Q With Sustained Elevated Temperature Storage at 100°C** (6576) Paper Publication **Pradeep Lall, Vishal Mehta, Jeffrey Suhling,** *Auburn University,* **David Locker,** *U.S. Army RDECOM*
5-7: Organic Materials and Devices Fourth Floor, Huntington B Session Organizers: **Malte Gather,** *University of St. Andrews,* **Yunbin He,** *Hubei University*	**Mechanical Instability in Organic Optoelectronics: Surface Wrinkling and Its Prediction** (6355) Presentation Only **Yu-Lin Shen,** *University of New Mexico*	**Organic Electronics for Neuromorphic Computing** (6375) Presentation Only **Yoeri van de Burgt**, *Eindhoven University of Technology*	**Double Perovskites as p-Type Conducting Transparent Semiconductors: A High-Throughput Search** (6378) Presentation Only **Haichen Wang, Miguel A.L. Marques,** *Martin-Luther-Universität Halle-Wittenberg*	**Designed Silver Nanowires Transparent Conductive Electrodes for Efficient Optoelectronic Devices** (6380) Presentation Only **Bin Hu,** *Huazhong University of Science and Technology*
6-8: Microchannel Heat Sinks Fourth Floor, Huntington C Session Organizers: **Hyoungsoon Lee,** *Chung-Ang University,* **Bladimir Ramos Alvarado,** *Pennsylvania State University*	**Experimental Investigation of Single-Phase Cooling in Embedded Microchannels: 3D Manifold Heat Exchanger With R-245fa** (6400) Paper Publication **Ki Wook Jung, Medhi Asheghi, Kenneth Goodson,** *Stanford University,* **Hyoungsoon Lee,** *Chung-Ang University,* **Chirag R. Kharangate,** *Case Western Reserve University,* **Feng Zhou, Ercan Dede,** *Toyota*	**Single-Phase Thermal and Hydraulic Performance of Embedded Micro-Pin Fin Using R245fa** (6382) Presentation Only **Daeyoun Kong, Sangwoo Jung, Daewoong Jung, Hyoungsoon Lee,** *Chung-Ang University,* **Ki Wook Jung, Mehdi Asheghi, Kenneth Goodson,** *Stanford University,* **Joseph Schaadt,** *Villanova University,* **Madhusudan Iyengar, Chris Malone,** *Google,* **Chirag R. Kharangate,** *Case Western Reserve University*	**Parametric Study of Silicon-Based Embedded Microchannels With 3D Manifold Coolers (EMMC) for High Heat Flux (~1 kW/cm²) Power Electronics Cooling** (6472) Paper Publication **Ki Wook Jung, Sougata Hazra, Heungdong Kwon, Alisha Piazza, Mehdi Asheghi, Kenneth Goodson,** *Stanford University,* **Edward Jih, Man Prakash Gupta, Michael Degner,** *Ford Motor Company*	
7-1: Batteries, Supercapacitors, and Solar Cells I Fourth Floor, Palos Verdes A Session Organizers: **Amy Marconnet,** *Purdue University,* **June Stanley,** *Sandia National Laboratories*	**Operando Measurements of the Dominant Thermal Resistance in Lithium-Ion Batteries** (6658) Presentation Only **Sean Lubner, Sumanjeet Kaur, Yanbao Fu, Vince Battaglia, Ravi Prasher,** *Lawrence Berkeley National Laboratory*	**Lithium Plating and Dendrites in Li-Ion Batteries Under Thermal Gradient** (6432) Presentation Only **Conner Fear, Aashutosh Mistry, Partha Mukherjee,** *Purdue University,* **Rachel Carter, Corey T. Love,** *U.S. Naval Research Laboratory*	**Effects of Non-Uniform Temperature Distributions on Lithium-Ion Battery Degradation** (6477) Presentation Only **Gabriel M. Cavalheiro, Takuto Iriyama, Shan Huang, George Nelson, Guangsheng Zhang,** *University of Alabama in Huntsville*	**Effect of Transition Metal Prussian Blue Analogues as Mediators on the Performance of Mediator Supercapacitor** (6478) Presentation Only **Xiangyang Zhou,** *University of Miami*
8-5: Material Modeling for Automotive Packaging II Fourth Floor, Palos Verdes B Session Organizers: **Adam Boros,** *Bosch,* **Anna Prakash,** *Intel*	**Nanoindentation Testing of SAC305 Solder Joints Subjected to Thermal Cycling Loading** (6471) Paper Publication **Abdullah Fahim, S.M. Kamrul Hasan, Jeffrey Suhling, Pradeep Lall,** *Auburn University*	**Constitutive Modeling and Experimental Characterization of Volumetric and Isochoric Nonlinear Viscoelasticity for Epoxy-Based Molding Compounds** (6409) Presentation Only **Fabian Welschinger, Przemyslaw Jakub Gromala,** *Bosch,* **Hüsnü Dal,** *Middle East Technical University in Ankara,* **Hyun Seop Lee, Bongtae Han,** *University of Maryland*	**Effects of Thermal Cycling on the Mechanical and Microstructural Evolution of SAC305 Lead-Free Solder** (6563) Paper Publication **S.M. Kamrul Hasan, Abdullah Fahim, Jeffrey Suhling, Sa'd Hamasha, Pradeep Lall,** *Auburn University*	**Investigation of the Effects of High Temperature Aging on Mechanical Behavior and Microstructural Changes in Lead Free Solders** (6571) Paper Publication **Jing Wu, Mohammad S. Alam, Jeffrey Suhling, Pradeep Lall,** *Auburn University*

Technical Sessions

TUESDAY, OCTOBER 8, 3:30PM–5:00PM

	3:30PM	3:50PM	4:10PM	4:30PM
5-8: Packaging and Thermal Management I Fourth Floor, Huntington A Session Organizers: **Firooz Faili**, *Element Six,* **Duanjun Cai**, *Xiamen University*	**Numerical Analysis of Pulse Laser Assisted Curing Region of Photocurable Resins** (6356) Paper Publication **Yuta Nakamura, Kazuyoshi Fushinobu, Asato Tamura,** *Tokyo Institute of Technology*	**Vandal Glass Heat Distribution and the Effect of Glass Gap Adjustments in Outdoor Digital Display Components** (6391) Paper Publication **Jeho Kim, Yogendra Joshi, Zhuomin Zhang, Peiyan Yang,** *Georgia Tech,* **J. Michael Brown, Kevin O'Connor, Marcos Diaz,** *Manufacturing Resources International*	**Topology Optimization of Time-Transient Heat Conduction for Thermo-Optic Devices** (6526) Presentation Only **Ercan Dede, Paul Schmalenberg, Tsuyoshi Nomura,** *Toyota,* **Gil Ho Yoon,** *Hanyang University*	**Modeling of Light Emitting Device Populations in the Electrical, Thermal, and Optical Domain for Luminaire Design** (6547) Paper Publication **Gabor Farkas, Marta Rencz, Andras Vass Varnai, Lajos Gaal,** *Mentor Graphics*
6-9: Phase Change Materials Fourth Floor, Huntington B Session Organizers: **Michael Fish,** *U.S. Army Research Laboratory,* **Jorge Padilla,** *Google*	**Evaluation of Thermal and Electrical Properties of Nano-Enhanced PCM for Usage in High-Voltage Systems** (6422) Paper Publication **Ange-Christian Iradukunda, Joshua Kasitz, Fernando Moreno, David Huitink,** *University of Arkansas*	**Metallic PCMs Microstructural Stability Under Repetitive Melting/Solidification Cycles** (6385) Paper Publication **Rafael Baez, Luis Gonzalez, Pedro Quintero,** *University of Puerto Rico at Mayaguez,* **Lauren Boteler,** *U.S. Army Research Laboratory*	**Lamellar Phase Change Material Composites for Power Electronics Thermal Management** (6751) Presentation Only **Patrick Shamberger, Alison Hoe, Michael Deckard, Achutha Tamraparni, Alaa Elwany, Jonathan Felts,** *Texas A&M University*	**Multi-Scale Multi-Fidelity Approaches to Power and Thermal System Engineering Challenges** (6772) Invited Presentation **Nicholas Niedbalski,** *U.S. Air Force*
6-10: Thermal Interface Materials Fourth Floor, Huntington C Session Organizers: **Xuhui Feng,** *National Renewable Energy Laboratory,* **Dinesh P R Thanu,** *Intel*	**Evaluation of Contact Thermal Resistance of Metal Material in Low Contact Pressure Region** (6543) Presentation Only **Yoshiki Hyodo, Tomoyuki Hatakeyama, Masaru Ishizuka,** *Toyoma Prefectural University,* **Risako Kibushi,** *Sanyo-Onoda City University*	**Thermal Contact Resistance at DBC Interfaces** (6609) Presentation Only **Lauren Boteler,** *U.S. Army Research Laboratory,* **Ronald Warzoha,** *U.S. Naval Academy*	**Thermo-Mechanical Degradation of Thermal Interface Materials: Accelerated Test Development and Reliability Analysis** (6416) Paper Publication **Dustin Pense, Hayden Carlton, David Huitink,** *University of Arkansas*	
7-6: Batteries, Supercapacitors, and Solar Cells III Fourth Floor, Palos Verdes A Session Organizers: **Laura Spinella,** *National Renewable Energy Laboratory,* **Kazuaki Yazawa,** *Purdue University*	**Three-Dimensional Modeling of Mediator-Enhanced Solid-State Supercapacitors** (6481) Presentation Only **Xiangyang Zhou,** *University of Miami*	**Application of Electronics Packaging Fundamentals to Photovoltaic Interconnects and Packaging** (6520) Paper Publication **Laura Spinella, Nick Bosco,** *National Renewable Energy Laboratory*	**Development of Structural Supercapacitors With Epoxy Based Adhesive Polymer Electrolyte** (6480) Presentation Only **Xiangyang Zhou,** *University of Miami*	

Technical Sessions

WEDNESDAY, OCTOBER 9, 8:00AM–9:30AM

	8:00AM	8:20AM	8:40AM	9:00AM
1-2: Thermal Management Applications I Fourth Floor, Huntington A Session Organizers: **Srikanth Rangarajan**, *Binghamton University,* **Leila Choobineh**, *SUNY Polytechnic Institute*	**Thermal Cycle Reliability of Package on Package (PoP) Assemblies** (6317) Presentation Only **Reza Ghaffarian,** *NASA Jet Propulsion Laboratory*	**Optimal Arrangement of Multiple Heat Sources in Vertically Stacked Two-Layer 3D IC Using Genetic Algorithm** (6334) Paper Publication **Srikanth Rangarajan, Yaser Hadad, Bahgat Sammakia,** *Binghamton University,* **Leila Choobineh,** *SUNY Polytechnic Institute*	**Thermal-Switch-Enabled Power Electronics Isothermalization** (6738) Presentation Only **Tianyu Yang, Nenad Milijkovic, William King,** *University of Illinois at Urbana-Champaign,* **Fei Diao, Alan Mantooth, Yue Zhao,** *University of Arkansas*	
4-3: Flexible Electronics Packaging & Assembly Fourth Floor, Huntington B Session Organizers: **Pradeep Lall,** *Auburn University,* **Baris Dogruoz,** *Cisco Systems*	**Applying Ultrasonic Dehumidification Technology for Water Rejection in Wearable Electronics** (6387) Paper Publication **Priyanka Deo, Samuel Graham,** *Georgia Tech,* **Ayyoub Momen,** *Oak Ridge National Laboratory*	**Foldable Thermal Ground Plane for Cooling of Foldable Smartphones** (6351) Presentation Only **Ali Nematollahisarvestani, Yung Cheng Lee**, *University of Colorado, Boulder,* **Ryan Lewis,** *Kelvin Thermal Technologies*	**Stretchable and Wearable Emitters Based on Corrugated Nickel for Personal Thermal Management** (6628) Presentation Only **Anirudh Krishna, Martí Sala-Casanovas, Ziqi Yu, Jaeho Lee,** *University of California, Irvine*	**How Ultrathin Die Enable Flexible Hybrid Electronics** (6769) Invited Presentation **Wilfred Bair,** *NextFlex*
5-9: Packaging and Thermal Management II Fourth Floor, Huntington C Session Organizers: **Niamh Richardson,** *University of Limerick,* **Ercan Dede,** *Toyota*	**Study on the Precise Measurement of LED Thermal Resistance Based on LEDs With an Internal Sensor Unit** (6321) Presentation Only **Yugang Zhou, Renbao Tian, Zili Xie, Bin Liu, Rong Zhang, Youdou Zheng,** *Nanjing University*	**Prediction and Control Technique of the Paper Media Temperature After Fusing in Electrophotographic Process** (6396) Paper Publication **Shunsuke Kawasaki, Shinichi Kuramoto, Kazuyoshi Fushinobu, Koichi Kato,** *Tokyo Institute of Technology,* **Kimiharu Yamazaki, Kaori Hemmi,** *Ricoh*	**Reducing CTE Mismatch and Maximizing Heat Transport on Single Emitter Laser Diodes Using Diamond Heat Spreaders** (6599) Presentation Only **Firooz Faili, Alex Muhr, Thomas Obeloer, Daniel Twitchen,** *Element Six Technologies*	
6-5: High-Temperature Electronics Packaging Fourth Floor, Palos Verdes B Session Organizers: **Douglas DeVoto,** *National Renewable Energy Laboratory,* **Christina DiMarino,** *Virginia Tech*	**Aging Dependent Anand Parameters of SAC305 Lead Free Solder at Extreme High Temperatures** (6564) Presentation Only **K.M. Rafidh Hassan, Mohammad S. Alam, Jeffrey Suhling, Pradeep Lall,** *Auburn University*	**Evaluation of a Lead Glass for Encapsulating High-Temperature Power Modules for Aerospace Application** (6393) Paper Publication **Lanbing Liu, David Nam, Rolando Burgos, Guo-Quan Lu,** *Virginia Tech,* **Ben Guo,** *United Technologies Research Center*	**Health Monitoring of PCBs Under Mechanical Shock Loads** (6578) Paper Publication **Pradeep Lall, Tony Thomas, Jeffrey Suhling,** *Auburn University,* **Ken Blecker,** *U.S. Army CCDC-AC*	**Advances in Organic Substrate Approaches for High Voltage Power Electronics Packaging** (6770) Invited Presentation **Douglas Hopkins,** *North Carolina State University*
6-11: System-Level Thermal Design I Fourth Floor, Palos Verdes A Session Organizers: **Todd Bandhauer,** *Colorado State University,* **David Huitink,** *University of Arkansas*	**Modular Heat Sinks for Enhanced Thermal Management of Electronics** (6665) Presentation Only **Muhammad Jahidul Hoque, Ahmet Gunay, Andrew Stillwell, Yashraj Gurumukhi, Nenad Milijkovic,** *University of Illinois at Urban-Champaign,* **Robert Pilawa-Podgurski,** *University of California, Berkeley*	**Thermal Analysis of High Efficiency High Speed Drives** (6534) Paper Publication **Yasmin Khakpour, Weilun Warren Chen, Parikshith Channegowda, Matthew R. Pearson, Yongduk Lee, Luis Arndeo,** *United Technologies Research Center*	**Evaluation of Low Order Stress Models for Use in Co-Design Analysis of Electronics Packaging** (6381) Paper Publication **Lauren Boteler,** *U.S. Army Research Laboratory,* **Steven Miner,** *U.S. Naval Academy*	**Multi-Scale Thermal Analysis for Design of SiC-Based Medium Voltage Motor Drive** (6631) Paper Publication **J. Emily Cousineau, Kevin Bennion,** *National Renewable Energy Laboratory,* **Karun Potty, He Li, Risha Na, Longya Xu, Jin Wang,** *Ohio State University*

Technical Sessions

WEDNESDAY, OCTOBER 9, 10:45AM–12:15PM

	10:45AM	11:05AM	11:25AM	11:45AM
1-8: Thermal Management Applications II Fourth Floor, Huntington A Session Organizers: **Yuling Niu**, *Binghamton University,* **Leila Choobineh**, *SUNY Polytechnic Institute*	**Thermal Analysis of 3D ICs With TSVs Placement Optimization** (6417) Paper Publication **Zongqing Ren, Ayed Alqahtani, Nader Bagherzadeh, Jaeho Lee,** *University of California, Irvine*	**Fabrication Steps and Thermal Modeling of Three-Dimensional Asynchronous Field Programmable Gate Array (3D-AFPGA)** (6514) Paper Publication **Robert Carroll, Carlos Gutierrez, Leila Choobineh, Robert Geer,** *SUNY Polytechnic Institute*	**Power Delivery and Thermal Management for the Silicon Interconnect Fabric** (6550) Presentation Only **Ujash Shah, Pranav Ambhore, Umesha Mogera, Subramanian Iyer, Timothy Fisher, Boris Vaisband,** *University of California, Los Angeles*	**Generating Ultra-Packed Thermal Greases With Ellipsoidal Fillers and Evaluation of Their Effective Properties** (6669) Presentation Only **Huanyu Liao, Sukshitha Achar Puttur Lakshminarayana, Ganesh Subbarayan,** *Purdue University*
4-4: Interconnect Reliability in Flexible Systems Fourth Floor, Huntington B Session Organizers: **Vaibhav Agrawal,** *Intel,* **Benjamin Leever,** *Air Force Research Laboratory*	**Damage of Flexible Electronic Line Printed With Ag Nanoparticle Ink due to High-Current Density** (6408) Paper Publication **Daiki Saito, Kazuhiko Sasagawa, Takeshi Moriwaki, Kazuhiro Fujisaki,** *Hirosaki University*	**Stress Evaluation of Flexible Displays With Multiple-Laminations Architecture Enabled by Experimental Measurement and Simulation Based Factorial Design** (6541) Paper Publication **Chang-Chun Lee, Pei-Chen Huang, Chi-Wei Wang, Oscar Chuang,** *National Tsing Hua University*	**Folding-Reliability of Flexible Electronics in Wearable Applications** (6584) Paper Publication **Pradeep Lall, Hyesoo Jang,** *Auburn University,* **Benjamin Leever,** *Air Force Research Laboratory,* **Scott Miller,** *NextFlex*	**Flexure and Twist Test Reliability Assurance of Flexible Electronics** (6579) Paper Publication **Pradeep Lall, Jinesh Narangaparambil,** *Auburn University,* **Benjamin Leever,** *Air Force Research Laboratory,* **Scott Miller,** *NextFlex*
6-12: System-Level Thermal Design II Fourth Floor, Huntington C Session Organizers: **Nicholas Niedbalski,** *U.S. Air Force,* **Kristen Hines,** *Johns Hopkins*	**System Electrothermal Transient Analysis of a High Current (40A) Synchronous Step-Down Converter** (6384) Paper Publication **Rajen Murugan, Jie Chen, Todd Harrison,** *Texas Instruments,* **C.T. Kao, Nathan Ai,** *Cadence Design Systems*	**Direct Bonding of Aluminum Foam With AlSiC for Rapid Fabrication of Power Electronic Packages** (6733) Presentation Only **Darshan Pahinkar, Chidinma Imediegwu, Brian Kelly, Samuel Graham,** *Georgia Tech,* **Jordon Hoyer,** *Mississippi State University*	**Effects of Cooling Architecture and PCB Layout Co-Design on the Concurrent Thermal and Electrical Performance of an On-Board Electric Vehicle Charger** (6434) Paper Publication **Omri Tayyara, Kshitij Gupta, Carlos Da Silva, Miad Nasr, Amir Assadi, Olivier Trescases, Cristina H. Amon,** *University of Toronto*	
7-7: Thermal Characterization Fourth Floor, Palos Verdes A Session Organizers: **Ayyoub Momen,** *Oak Ridge National Laboratory,* **Aritra Sur,** *United Technologies Research Center*	**Pressure-Dependent Thermal Characterization of Inverse Opal Copper Structures** (6606) Presentation Only **Cheng-Hui Lin, Youngjoon Suh, Yoonjin Won,** *University of California, Irvine*	**Combined Experimental-Numerical Investigation of Microstructure and Thermal Conduction in Dispensed and Squeezed Thermal Interface Materials** (6462) Presentation Only **Rajath Kantharaj, Jackson Santana, Carl Wassgren, Aaron Morris, Amy Marconnet,** *Purdue University*	**Surface Temperature Measurements using Infrared Thermometry Considering Background Radiation From High-Temperature Environment** (6505) Presentation Only **Mingeon Kim, Bong Jae Lee,** *Korea Advanced Institute of Science and Technology,* **Dong Hwan Shin, Jinsub Kim, Jungho Lee,** *Korea Institute of Machinery and Materials*	**Experimental Investigation of Asymmetrical Microdroplet Evaporation on Heated Porous Pillar Array Structures** (6449) Presentation Only **Li Shan, Runzhi Zhang, Xinyu Jiang, Binjian Ma, Damena Agonafer,** *Washington University in St. Louis,* **Jorge Padilla,** *Google*
8-1: ECU-Level Reliability Fourth Floor, Palos Verdes B Session Organizers: **Ercan Dede,** *Toyota,* **Hyun Seop Lee,** *University of Maryland*	**Effects of Test Temperature and Prior Aging on the Cyclic Stress-Strain Behavior of Lead-Free Solders** (6562) Paper Publication **Mohammad Ashraful Haq, Mohd Aminul Hoque, Jeffrey Suhling, Pradeep Lall,** *Auburn University*	**A Study on Relationship Between Low Cycle Fatigue Strength and Load Conditions for Lead Fee Solder Material** (6446) Presentation Only **Takashi Kawakami, Takahiro Kinoshita, Yuki Murai,** *Toyama Prefectural University*	**The Effect of Low Temperature Conditions on Vibration Durability of SAC105 Interconnects** (6509) Presentation Only **David Lesli, Abhijit Dasgupta,** *University of Maryland,* **Karsten Meier, Maximilian Ochmann,** *Technische Universität Dresden,* **Tamara Storz,** *Hochschule Mannheim*	**Automated Method Using Finite Element Analysis to Identify Plated Through Holes and Microvia Stacks at Failure Risk in Complex PCB Designs** (6347) Paper Publication **Kourosh Kalayeh, Nathan Blattau, Craig Hillman,** *DfR Solutions,* **Natalie Hernandez,** *ANSYS*

Technical Sessions

WEDNESDAY, OCTOBER 9, 1:45PM–3:15PM

	1:45PM	2:05PM	2:25PM	2:45PM
2-7: Immersion Cooling II Fourth Floor, Palos Verdes B Session Organizers: **Nikhil Lakhkar**, *Emerson Climate Technologies,* **Steve Moon**, *3M*	**Impact of Immersion Cooling on Thermo-Mechanical Properties of PCBs and Reliability of Electronic Packages (6568)** Paper Publication **Shrinath Ramdas, Pavan Rajmane, Tushar Chauhan, Abel Misrak, Dereje Agonafer,** *University of Texas at Arlington*	**Computational Analysis for Thermal Optimization of Server for Single Phase Immersion Cooling (6587)** Paper Publication **Dhruvkumar Gandhi, Dereje Agonafer, Tushar Chauhan, Uschas Chowdhury, Satyam Saini, Pratik Bansode, Jimil M. Shah,** *University of Texas at Arlington*	**Computational Form Factor Study of a Third-Generation Open Compute Server for Single-Phase Immersion Cooling** (6602) Paper Publication **Jimil M. Shah, Chinmay Bhatt, Pranavi Rachamreddy, Ravya Dandamudi, Satyam Saini, Dereje Agonafer,** *University of Texas at Arlington*	
3-1: IoT Applications Fourth Floor, Huntington A Session Organizers: **Baris Dogruoz**, *Cisco Systems,* **Damena Agonafer**, *Washington University in St. Louis,* **Anil Yuksel,** *IBM,* **Mehmet Arik,** *Ozyegin University*	**Thermal Characterization of Composite Ultra-High Molecular Weight Polyethylene Fabrics** (6412) Presentation Only **Aaditya Candadai, Justin Weibel, Amy Marconnet,** *Purdue University*	**Packaging Environmental Sensors for an Internet-of-Things Solution for Urban-Microclimate Studies** (6515) Paper Publication **Shuv Dey, Yogendra Joshi,** *Georgia Tech,* **J. Michael Brown,** *Manufacturing Resources International*	**Ultra-Low SWaP CO_2 Sensing for Demand Control Ventilation** (6747) Presentation Only **Elif Karatay, Eric Cocker, Kyle Arakaki, David Schwartz,** *Palo Alto Research Center*	**An RF-Powered Self-Locating Flexible Building Environment Sensor System** (6306) Presentation Only **David Schwartz, Shabnam Ladan, Vijay Venkatasubramanian, Clinton Smith, Joseph Lee, Ping Mei, Brent Krusor, Shakthi Gowri,** *Palo Alto Research Center*
4-5: Process Development and Characterization of Flexible Systems Fourth Floor, Huntington B Session Organizers: **David Schwartz, Janos Veres,** *Palo Alto Research Center,* **Vaibhav Agrawal,** *Intel*	**Process Capability of Aerosol-Jet Additive Processes for Long-Runs up to 10 Hours** (6569) Paper Publication **Pradeep Lall, Amrit Abrol, Nakul Kothari,** *Auburn University,* **Benjamin Leever,** *Air Force Research Laboratory,* **Scott Miller,** *NextFlex*	**Effect of Charge-Discharge Depth and Environment Use Conditions on Flexible Power Sources** (6570) Paper Publication **Pradeep Lall, Amrit Abrol, Ved Soni,** *Auburn University,* **Benjamin Leever,** *Air Force Research Laboratory,* **Scott Miller,** *NextFlex*	**Effect of Process Parameters on Aerosol Jet Printing of Multi-Layer Circuitry** (6574) Paper Publication **Pradeep Lall, Kartik Goyal, Nakul Kothari,** *Auburn University,* **Benjamin Leever,** *Air Force Research Laboratory,* **Scott Miller,** *NextFlex*	**Acceleration Factors for Flexible Electronics in Wearable Applications From Actual Human Body Measurements** (6580) Paper Publication **Pradeep Lall, Tony Thomas, Vikas Yadav, Jinesh Narangaparambil, Wei Liu,** *Auburn University*
6-13: System Integration Fourth Floor, Huntington C Session Organizers: **Ramchandra Kotecha,** *National Renewable Energy Laboratory,* **Sangbeom Cho,** *Qualcomm*	**Comparative Study on Power Module Architectures for Modularity and Scalability** (6443) Paper Publication **Mei-Chien Lu,** *Monte Rosa Technology*	**Integration Challenges of SiC Power Module for High Temperature and High Frequency Operation** (6548) Presentation Only **Shohei Suenaga, Shailesh N. Joshi,** *Toyota*	**Parametric and Sensitivity Analysis of Power Module Design** (6592) Paper Publication **Lauren Boteler, Michael Fish, Morris Berman,** *U.S. Army Research Laboratory*	**Packaging and Integration of an Additively Manufactured Photovoltaic Inverter** (6411) Presentation Only **Akanksha Singh,** *National Renewable Energy Laboratory*
7-8: Thermal Switches and Thermal Metamaterials Fourth Floor, Palos Verdes A Session Organizers: **Menglong Hao,** *University of California, Berkeley,* **Sean Lubner,** *Lawrence Berkeley National Laboratory*	**3D Architected Packaging Structures for Thermal Management** (6415) Presentation Only **Shiva Farzinazar, Jaeho Lee,** *University of California, Irvine*	**Continuously Tunable Thermal Switch Based on Compressible Graphene Foams** (6554) Presentation Only **Luis Delgado, Amy Marconnet, Xiulin Ruan,** *Purdue University,* **Tingting Du,** *Shangdong University*	**Modeling and Analysis of a Shape Memory Alloy-Based Adaptive Regulator for Thermal Management** (6402) Paper Publication **Gary Liang, Ashkan Sadeghifard, Anirudh Krishna, Jaeho Lee, Edwin Peraza Hernandez,** *University of California, Irvine*	**Environmental Testing of a Temperature Regulator Based on Compressible Graphene Foams** (6557) Presentation Only **Tingting Du,** *Shangdong University,* **Weizhi Liao, Luis Delgado, Joseph Peoples, Amy Marconnet, Xiulin Ruan,** *Purdue University*

Technical Sessions

WEDNESDAY, OCTOBER 9, 3:30PM–5:00PM

	3:30PM	3:50PM	4:10PM	4:30PM
4-2: Microfluidics for Flexible Electronics Fourth Floor, Huntington B Session Organizers: **Azar Alizadeh,** *General Electric,* **E. Yegan Erdem,** *Bilkent University*	**Textured Superoleophobic Surfaces: Fabrication and Characterization** (6713) Presentation Only **Ecem Yelekli, E. Yegan Erdem,** *Bilkent University*	**Experimental Study of Flexible Electrohydrodynamic Conduction Pumping for Electronics Cooling** (6746) Presentation Only **Alexander J. Castaneda, Nathaniel O'Connor, Jamal Yagoobi,** *Worcester Polytechnic Institute*	**Bio-Applications of Wearable Sensors** (6775) Invited Presentation **Andrew Burns,** *General Electric*	**Microfluidic Devices for Health Monitoring** (6774) Invited Presentation **Leanna Levine,** *Aline*
6-14: Additive Manufacturing Fourth Floor, Huntington C Session Organizers: **Douglas Hopkins,** *North Carolina State University,* **Stephen Lynch,** *Pennsylvania State University*	**Additive Manufactured, Low EMI, Non-Metallic Convective Heat Spreader Design and Optimization** (6442) Paper Publication **Reece Whitt, David Huitink, Skyler Hudson, Bakhtiyar Mohammad Nafis, Zhao Yuan, Balaji Narayanasamy, Amol Deshpande, Fang Luo, Asif Imran,** *University of Arkansas,* **Zion Clarke, Sonya Smith,** *Howard University*	**A Numerical Investigation of Additive Manufactured Foam Structures for Single Phase Hotspot Thermal Management** (6519) Paper Publication **Justin Broughton, Yogendra Joshi,** *Georgia Tech*	**Advanced Packaging and Thermal Management of High-Power DC-DC Converters** (6559) Paper Publication **Sevket Umut Yuruker, Raphael Mandel, Patrick McCluskey, Michael Ohadi, Shiladri Chakraborty, Yongwan Park, He Yun, Alireza Khaligh,** *University of Maryland,* **Lauren Boteler, Miguel Hinojosa,** *U.S. Army Research Laboratory*	**Additive Manufactured Hybrid Cold Plates for Efficient Thermal Management of High-Power Density Electronics** (6664) Presentation Only **Muhammad Jahidul Hoque, Nithin Vinod Upot, Nenad Milijkovic,** *University of Illinois at Urbana-Champaign*
6-15: Emerging Technologies Fourth Floor, Palos Verdes A Session Organizers: **Paul Paret,** *National Renewable Energy Laboratory,* **Patrick McCluskey,** *University of Maryland*	**Evolution of Anand Parameters With Elevated Temperature Aging for SAC Leadfree Alloys** (6577) Paper Publication **Pradeep Lall, Vikas Yadav, Jeffrey Suhling,** *Auburn University,* **David Locker,** *U.S. Army RDECOM*	**Simulating the Effect of Elastic Particle Inclusion on the Mechanical Properties of Transient Liquid Phase Sintered (TLPS) Alloys** (6435) Presentation Only **Gilad Nave, Erick Gutierrez, Patrick McCluskey,** *University of Maryland*	**Quantitative Characterization of Sapphire and Silicon Nitride for Space Applications Circuit Subassemblies Using Cryogenic Cycling** (6499) Paper Publication **Kirsten Lovelace, Sonya Smith,** *Howard University*	**Effect of Low Melting Point Bridge With High Melting Point Fine Filler on the Conductivity of Conductive Adhesive** (6403) Presentation Only **Michiya Matsushima, Shogo Minami, Naoki Ito, Shinji Fukumoto, Kozo Fujimoto,** *Osaka University*
7-10: Batteries, Supercapacitors, and Solar Cells II Fourth Floor, Palos Verdes B Session Organizers: **Xiangyang Zhou,** *University of Miami,* **Chuanbo Yang,** *National Renewable Energy Laboratory*	**Li-Ion Battery Impact Testing** (6710) Presentation Only **June Stanley,** *Sandia National Laboratories*	**The Role of Interfacial Thermal Resistance in Li-Ion Battery Thermal Management** (6594) Paper Publication **Chuanbo Yang, Lei Cao,** *National Renewable Energy Laboratory*	**In-situ Diagnosis of Li-Ion Battery Internal Short Circuit** (6757) Presentation Only **Shan Huang, Guangsheng Zhang,** *University of Alabama in Huntsville*	**A High-Performance Polymer Electrolyte Membrane Based on Poly (Vinylidene Fluoride) and Graphene Oxide Doped With Redox Species** (6479) Paper Publication **Xiangyang Zhou,** *University of Miami*
8-7: Reliability of Electronic Components for Harsh Environment Fourth Floor, Redondo Session Organizers: **Fabian Welschinger,** *Bosch,* **David Huitink,** *University of Arkansas*	**Effects of Shear Cycling on the Mechanical Properties of SAC and SAC+X Lead Free Solder Joints** (6567) Paper Publication **Mohd Aminul Hoque, Md. Mahmudur Chowdhury, Jeffrey Suhling, Sa'd Hamasha, Pradeep Lall,** *Auburn University*	**Demonstration of Two-Layer Wicks for High-Heat-Flux Dissipation in Vapor Chambers** (6367) Presentation Only **Srivathsan Sudhakar, Justin Weibel,** *Purdue University,* **Feng Zhou, Ercan Dede,** *Toyota,* **Suresh Garimella,** *University of Vermont*	**Effect of Drop Angle Variation and Restraint Mechanisms on Surface Mount Electronics Under High G Shock** (6575) Paper Publication **Pradeep Lall, Aathi Raja Ram Pandurangan, Jeffrey Suhling, Venkata Kalyan Reddy Dornala,** *Auburn University,* **John Deep,** *U.S. Air Force Research Laboratory,* **Ryan Lowe,** *ARA Associates*	**Modeling of Underfilled PBGA Assemblies Using Both Viscoelastic and Elastic Material Properties** (6561) Paper Publication **Promod Chowdhury, Jeffrey Suhling, Pradeep Lall,** *Auburn University*