



The 2023 IEEE 73rd Electronic Components and Technology Conference



CALL FOR PAPERS

JW MARRIOTT ORLANDO, GRANDE LAKES, ORLANDO, FLORIDA, USA • MAY 30 - JUNE 2, 2023



INTRODUCTION

On behalf of the IEEE Electronic Components and Technology Conference (ECTC) Program Committee, it is my pleasure to invite you to submit an abstract for the 73rd ECTC, to be held May 30 - June 2, 2023, at JW Marriott Orlando, Grande Lakes, Orlando, Florida. This premier international conference, sponsored by the IEEE Electronics Packaging Society (EPS), covers a wide spectrum of electronic packaging technology topics, including components, materials, assembly, interconnect design, device and system packaging, heterogeneous integration, wafer-level packaging,

Si photonics and optoelectronics, IoT, 5G and emerging technologies, 2.5D and 3D integration technology, modeling and reliability.

The ECTC Program Committee consists of over 200 experts from broad-ranging technical areas and is committed to creating an engaging technical program for all. ECTC typically attracts more than 1,500 attendees from over 20 countries. This year's 72nd ECTC was held in-person for the first time in three years. The conference had 1509 registered attendees from 24 countries around the world with 362 technical papers, presented in 36 oral and five interactive presentation sessions, including one dedicated to students. Additionally, there were nine special sessions on wide-ranging and important topics such as workforce development, diversity, and retention, or micro-LED display technology challenges. A total of 105 companies showcased their latest products and services in the Technology Corner Exhibits. Last but not least, the 72nd ECTC was supported by our amazing sponsors. The 73rd ECTC will continue with the same tradition of being the premium venue to showcase all the latest developments in the electronic components industry where packaging has become a way to achieve device and system performance scaling.

The 73rd ECTC program will include Special Sessions and 16 Professional Development Courses (PDCs) on the first day of the conference (Tuesday). During the following three days, we will have six parallel technical sessions in the mornings and afternoons, and other special topic panel discussions to present high-level trends and best practices in the industry. The PDCs are offered by world-class experts, enabling participants to broaden their technical knowledge base. The technical program and PDCs will be supplemented by the Technology Corner Exhibits, which provide an opportunity for leading companies in the electronic components, materials, and packaging fields to showcase their latest technologies and products. As the Program Chair of the 73rd ECTC, I invite you to submit an abstract between 250 and 750 words with 1 table (or figure) that describes the scope, content, and key points of your proposed technical paper at www.ectc.net. Please include at the beginning a 50-word paragraph to highlight the novelty of your work. First-time leading authors will be eligible for a raffle prize during the conference. The deadline for abstract and PDC proposal submission is October 10, 2022. Manuscripts between four and eight pages conforming to the ECTC format are due by February 24, 2023, for inclusion in the Conference Proceedings. The manuscripts will be reviewed in confidentiality by our Technical Committee members for content quality and scientific accuracy before acceptance. All abstracts and manuscripts must be original, free of commercial content, and non-confidential. The best papers will be considered for journal publications in special sections of the IEEE Transactions on Components, Packaging, and Manufacturing Technology, according to the Transactions guidelines. On behalf of the ECTC Program Committee, I look forward to seeing you at JW Marriott Orlando, Grande Lakes, Orlando, Florida, USA at the 73rd ECTC, May 30 - June 2, 2023.

Florian Herrault
73rd ECTC Program Chair

MAJOR TOPICS

Highly rated abstracts are accepted for presentation at the ECTC conference. It is important that authors identify the subcommittees whose topic areas best fit their abstracts. Abstracts should include original and previously unpublished, non-confidential, and non-commercial information on new developments, technology, and knowledge in the areas including, but not limited to, those given below for each technical subcommittee.

Applied Reliability: Reliability of 2D, 2.5D, Si-bridge, 3D, chiplets, SiP, WLCSP, FOWLP, FOPLP & heterogeneous integration; Interconnect reliability in micro-bump, micro-pillar, Cu-pillar, TSV, TGV, RDL, HDI, stacked-die, hybrid-bond, flip chip & wire bonded packages; Novel reliability test methods, life models, FA techniques & materials characterization; Component and board level reliability in computing, HPC, mobile, networking, automotive, power electronics, harsh/hy-temp environments, IoT, sensors, AI, autonomous vehicles, medical, wearable electronics, LEDs, displays & memory.

Assembly and Manufacturing Technology: Assembly and manufacturing challenges for new markets; Die bonding methods and processes; Embedded packaging and modules; Wafer level process/materials technologies; Die and package singulation manufacturing; New & next generation substrates; Smart factory/manufacturing; Design for Manufacturing; Assembly related test/yield hardware development; Integrating advanced thermal solutions in manufacturing; Design/performance, integrating solutions, thermal materials, low stress/high thermal; Process advancements/yield enhancements: Cost of inspection, sampling, metrology, new processes for fine RDL, small via fabrication, transfer/compression/injection mold; Heterogeneous integration and process: chiplets, 3D stacking, bridge technology, large body, warpage management; Shielding/protection technologies and manufacturing and market requirements.

Emerging Technologies: Emerging, novel and unique packaging and material technologies for: Soft and intelligent packaging; Flexible/stretchable hybrid electronics; Implantable biosensors and bioelectronics; Bio-resorbable packaging; Extreme harsh environment; Nanomanufacturing; Paper sensors/electronics pop-up/origami; MEMS & NEMS; Close-To-Motor high-voltage power electronics; Packaging for wide band gap devices; Anti-tamper; cryptography; Additive manufacturing; Packaging for quantum computing and electro-optical integration; Recyclable and sustainable electronics packaging; AI, ML and computer vision for packaging; Point-of-care diagnostic packaging; Space hardened packaging; Green and sustainable electronics; Net zero strategy/technology.

Interconnections: Interconnection Technology and Processing: Hybrid/direct Cu bonding, fan-out, panel-level, chiplets, SiP, flip-chip, 2.5D/3D, Si/glass/organic interposers, TSV, micro-bump, Cu pillar; wirebonding, thermo-compression bonding, fine-pitch/multi-layer RDL, printable interconnects, flexible substrates, photonic interconnects, quantum interconnects; Interconnection material, characterization and reliability; Conductive/non-conductive adhesives, low temperature solder; underfill, molding compounds, thermal interface materials, thermal/mechanical/electrical tests and reliability; Interconnection physical co-design and architectures for emerging applications- HPC, mobile, 5G, IoT, power and rugged electronics, medical and health, automotive, aerospace, flexible hybrid electronics, micro-LED display.

Materials & Processing: Wafer & panel level packaging materials; Materials for harsh environments; Packaging substrates; Flexible, stretchable, & wearable electronics; Wafer bond/

debond materials; TSV; Emerging electronic materials & processes; Novel solder metallurgies; Dielectrics and underfills; Molding compounds; Thermal interface materials; Advanced wirebonding, conductive adhesives

Packaging Technologies: Architectures, chiplets, and applications for 2.5 & 3D, TSV & interposer; Advanced flip-chip, SiP, CSP, PoP, MEMS, sensors & IoT; Automotive & power electronics; bio, medical, flexible & wearable packaging; Embedded & advanced substrates; Fan-out, wafer & panel level processes; Heterogeneous integration.

Photonics: Assembly and packaging for all applications that leverage photonics components and circuits. Packaging of Photonics Integrated Circuits for telecom, datacom, and 5G; Co-packaged and near-packaged optics; Heterogeneous integration; Artificial intelligence; quantum systems such as processors, sensors, and networks; Medical devices; Automotive/LIDAR; Aerospace, defense, and cryogenic/harsh environment; RF/MW photonics; Free-space optics; AR/VR; WDM; and high power lasers; Micro-LEDs and 3D light-field displays; Imaging and environmental sensors; New materials, connectors; EDA tools, and test methods/equipment.

RF, High-Speed Components & Systems: 5G/6G, IoT, cloud computing, autonomous vehicles, AI/machine learning; Antennas, radars, sensors, power transfer; EM shielding, wired/wireless communications, RF to THz Electrical and multi-physics modeling, simulation and characterization of interconnects, components, modules, and heterogeneous integration; Signal/power integrity, and chip/package/board co-design.

Thermal/Mechanical Simulation & Characterization: Thermal/mechanical simulation and characterization at component, board, and system levels for all packaging technologies; Reliability-related modeling including fracture mechanics, fatigue, electromigration, warpage, delamination, moisture, drop, shock and vibration, and modeling for harsh environments (thermal, chemical, etc.); Material constitutive relations; Chip-package interaction for heterogeneous integration, wafer fabrication and package assembly process related modeling; Novel modeling techniques including multi-scale physics, co-design approaches; Quantum computing; Measurement methodologies, characterization and correlations, model order reduction, sensitivity analysis, optimization, statistical analysis; Application of artificial intelligence on modeling, characterization, digital twin; Simulations for virtual release.

Interactive Presentations: Highly encouraged at ECTC, presenters and attendees often communicate more efficiently here than in oral presentations. Abstracts can relate to any electronics packaging topic. Interactive presentation session papers are published and archived in equal merit with the other ECTC papers. You are invited to submit an abstract between 250 and 750 words with 1 table (or figure) that describes the novelty, scope, content, and key points of your proposed manuscript via the website at www.ectc.net. Please start your abstract with a first paragraph of no more than 50 words to clearly highlight and summarize the novelty of your work.

If you have any questions, contact:
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Abstracts must be received by October 10, 2022. All abstracts must be submitted electronically at www.ectc.net. You must include the affiliation, contact telephone number, and e-mail address for all authors, besides the mailing address for the presenting author. First-time authors will be eligible for a raffle prize during the conference.

Visit the ECTC website (www.ectc.net) for additional conference information.

Abstract and Manuscript Submission

You are invited to submit an abstract between 250 and 750 words with 1 table (or figure) that describes the novelty, scope, content, and key points of your proposed paper via our website at www.ectc.net. Please start your abstract with a first paragraph of no more than 50 words to clearly highlight and summarize the novelty of your work.

Additional details on how to submit abstracts electronically can be found on the ECTC website under the "Author Info" tab. First-time authors will be eligible for a raffle prize during the conference. Submitted abstracts become the property of ECTC, and ECTC reserves the right to publish the abstracts accepted for the conference. ECTC also reserves the right to prohibit, limit, or reject any editing of submitted abstracts. Abstracts accepted for the conference may not be edited until manuscript submission. Abstracts must be received by October 10, 2022. Your submission must be cleared by management and co-authors as applicable and include the affiliation, contact telephone number, and e-mail address for all authors, besides the mailing address for the presenting author. Please select two different program subcommittees in order of preference that should evaluate your submission for acceptance. Authors will be notified of paper acceptance with instructions for publication by December 12, 2022. At the discretion of the Program Committee, submitted abstracts may be considered for Interactive Presentation sessions.

Manuscripts between 4 and 8 pages conforming to the ECTC format are due in final form for publication in the Conference Proceedings by February 24, 2023. **Manuscripts not submitted by this date may be removed and replaced in the final program at the discretion of the Program Committee.** The submitted content must be original, previously unpublished, non-confidential, and without commercial content. All submitted manuscripts are checked for plagiarism and excessive self-duplication of previously published work through the IEEE CrossCheck system.

New this year - We are proud to announce that a selection of the best papers will be invited to be published as journal publications in special sections of the **IEEE Transactions on Components, Packaging, and Manufacturing Technology** after the conference. The journal manuscript will have to follow the transaction guidelines.

For additional information regarding abstract and paper submission, please contact:
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Special Paper Recognition

Best Paper Award: Each year ECTC selects the best paper whose first author receives an ECTC personalized certificate and a check for \$3,000.

Best Interactive Presentation Award: Each year ECTC selects the best Interactive Presentation paper whose first author receives an ECTC personalized certificate and a check for \$2,000.

Outstanding Paper Award: An outstanding conference paper is also selected for special recognition by the ECTC. The first author receives a personalized certificate and a check for \$2,000.

Outstanding Interactive Presentation Award: An outstanding Interactive Presentation paper is also selected for special recognition by ECTC. The first author receives a personalized certificate and a check for \$1,500.

Intel Best Student Paper Awards: Intel Corporation is sponsoring awards for the best papers submitted and presented by a student at ECTC. The winning students will be presented with a certificate and a check for up to \$2,500.

Texas Instruments Outstanding Student Interactive Presentation Award: Texas Instruments is sponsoring an award for the best student Interactive Presentation at ECTC. The winning student will be presented with a certificate and a check for \$1,500.

Technology Corner Exhibits

ECTC invites you to be part of the Technology Corner Exhibits and showcase your products and services to engineers and managers from all areas of the microelectronics packaging industry. Over 1,500 attendees are expected for the 73rd ECTC, representing companies from around the world.

Exhibit Dates: May 31 & June 1, 2023

For more information contact:

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ECTC Exhibits Chair

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The 2023 exhibit electronic application form link and exhibit information brochure will be posted online at www.ectc.net under the "Exhibits" section in July 2022. Prospective exhibitors should fill out an application via the form link to start the process of reserving an exhibit space for 2023. ECTC exhibit booth allocation is first based on consecutive years of exhibit participation and/or Gold or Platinum Sponsorship. Please contact Alan Huffman at alan.huffman@ieee.org for more information or with any questions.

Sponsorship Opportunities to Enhance Your Presence at ECTC

ECTC also offers excellent opportunities for promotion and visibility through sponsorships at platinum, gold and silver levels as well as badge lanyard, media, refreshment breaks, program, special sessions, and the student reception. Additional information is available at www.ectc.net under "Sponsors". Please contact:

Wolfgang Sauter, Sponsorship Chair
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Call for Professional Development Courses

Proposals are solicited from individuals interested in teaching educational, four-hour long Professional Development Courses (PDCs) on topics described on the previous page. From the proposals received, 16 PDCs will be selected for offering at the 73rd ECTC on Tuesday, May 30, 2023. Each selected course will be given a minimum honorarium of \$1,500. In addition, instructors of the selected courses will be offered the speaker discount rate for the conference. Attendees of the PDCs will be offered Continuing Education Units (CEUs) or Professional Development Hours (PDHs). These CEUs and PDHs are recognized by employers as a formal measure of participation and attendance in "noncredit" self-study courses, tutorials, symposia, and workshops.

Using the format "Course Objectives/Course Outline/Who Should Attend," 200-word proposals must be submitted via the ECTC website at www.ectc.net by October 10, 2022. Authors will be notified of course acceptance with instructions by December 12, 2022. If you have any questions, contact:

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IEEE EPS Society Travel Grant Program

IEEE EPS is pleased to continue the IEEE EPS Travel Grant Program for the 73rd ECTC. The goals of this award are to foster maximum student participation in ECTC and to recognize students with superior ECTC papers. We encourage all student authors to apply for this prestigious grant that will allow you to participate fully in the premier conference for electronic packaging.

Description: Grants are available to apply towards actual travel expenses, including airfare, hotel, and meals. Grants will be awarded competitively, based on abstracts submitted by student authors. The student who is named as the primary author of each winning abstract will receive a travel grant.

Eligibility: The competition is open to all full-time graduate students enrolled at an accredited institution in a program of study within the scope of ECTC. The student must be listed as the primary author on the abstract. A maximum of two authors (one per paper) from any one institution will receive a travel grant.

Application Process: To apply, check the "IEEE EPS Society Travel Grant" box in the "Awards" section of the online abstract submission form. Pre-selected abstracts based on technical committee scores will be requested to submit an extended abstract.

Intel Student Paper Awards

Intel Corporation is sponsoring awards for the best papers submitted and presented by a student at ECTC. The winning students will be presented with a certificate and a check for up to \$2,500.

Eligibility: To be considered for the award, the student must be a full-time student for at least one semester after the conference conclusion. The student must be the lead author and present the paper at the 73rd ECTC. It is the convention at ECTC for the presenter to be listed as the first author. Finalists will be determined by a review of the completed manuscripts by the judging committee. Manuscripts will be reviewed for relevance to the competition topics, technical content, and originality. The author of the best student paper will be notified after the conference and must submit an affidavit from the student's faculty advisor certifying that the student meets the eligibility requirements.

Application Process: To enter the Intel Student Paper Award competition, please check the "Intel Best Student Paper Award" box in the "Awards" section of the online abstract submission form.

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