

# 2023 IEEE INTERNATIONAL RELIABILITY PHYSICS SYMPOSIUM

## Call for Papers

March 26<sup>st</sup> – March 30<sup>th</sup> 2023, Hyatt Regency, Monterey, CA USA

IRPS is the preeminent conference for timely research on Reliability Physics of devices, materials, circuits, and products used in the electronics industry; this is where important reliability challenges and solutions are first discussed.

Abstract submission due **October 24, 2022**

### IRPS 2023 focus topics:

- 1. Embedded / In-product memory / neuromorphic compute:** Reliability of emerging memory devices and design architectures with embedded memory as function/perf.booster
- 2. GAA, nanosheet, RibbonFET™, Forksheets:** TDDDB, BTI, HCI, process charging, HV effects
- 3. 3D IC advanced packaging:** 3D, 2.5D, interposer MIM, embedded bridge, hybrid bonding rel.

### Contributed papers are solicited in the following subject areas:

#### Circuits, Products, and Systems

- **Circuit Reliability and Aging** – Includes digital, mixed-signal, power and RF applications; design for reliability; variability-aware design, EDA tools and compact modeling
- **IC Product Reliability** – Includes burn-in; Early Failure Rate; defect detection; on-chip sensors; failure analysis; modeling; product reliability estimation; multichip product; stacked and HBM memory; DFT/DFR solutions for improved reliability; chipset reliability considerations
- **System Electronics Reliability** – Includes reliability of electronic systems used in a variety of applications including but not limited to consumer electronics, data centers, health care, space and automotive industry; architecture, design and modeling methods used to manage system reliability including “row hammer” scenarios; telemetry data collection and analysis techniques including machine learning and deep learning methods for large-scale data analysis and system qualification.
- **Soft Errors** – Includes impact of neutrons, alpha particles, protons and heavy ions on electronics, photonic devices and systems; Device, circuit, system and application level simulation and mitigation techniques for single-bit/multi-bit single event effects in memories and logic.
- **ESD and Latchup** – Includes component and system-level ESD design; modeling and simulation
- **Packaging and 2.5D/3D Assembly** – Includes chip-package interaction; fatigue; power dissipation issues; reliability of 2.5D and 3D IC packaging and TSV integration, interconnects, multichip modules, passive interposers
- **Reliability Testing** – Includes reliability equipment, tools, test structures, and test methods; design for reliability testing
- **Silicon Photonics** – Including reliability of integrated silicon photonics systems
- **RF/mmW/5G** – Reliability of CMOS, BiCMOS, SiGe, SOI, III-V and other devices in high frequency applications

#### Materials, Processing, and Devices

- **Transistors** – Includes hot carrier phenomena; BTI; RTN; advanced node scaling; variability; Ge and III-V channels; nano-wire, gate all-around, nano-ribbon, fork-sheet devices
- **Gate/MOL/BEOL Dielectrics** – Includes reliability of novel gate dielectrics and ferroelectrics; 2D layered dielectrics and van der Waals dielectrics for 2D materials based devices; modeling of dielectric breakdown; gate dielectric reliability for III-V, Ge, and advanced FETs; middle-of-the-line reliability; MIM/MOM capacitors; low-k dielectric breakdown
- **Beyond CMOS Devices** – Includes reliability of tunnel FETs, transistors with 2D semiconductors (graphene, MoS<sub>2</sub>); ferroelectric and negative capacitance FETs; spintronics
- **Neuromorphic Computing Reliability** – Reliability of logic and memory (MRAM, RRAM, etc) devices and design architectures used in neuromorphic computing and AI acceleration.
- **Gallium-Nitride and Silicon-Carbide Wide-Bandgap Semiconductors** – threshold voltage instabilities, charge trapping, switching stress, breakdown and other reliability topics including thermal issues within power devices.
- **Compound and Optoelectronic Devices** – Includes reliability of III-V-based devices; optoelectronic devices; far infrared detectors
- **Metallization/BEOL Reliability** – Includes electromigration; Joule heating; stress migration;
- **Process Integration** – Includes new process-related reliability issues; foundry reliability challenges
- **Failure Analysis** – Includes evidence of new failure mechanisms; advances in failure analysis techniques
- **Memory Reliability** – Includes stand-alone DRAM and 3DNAND;
- **Emerging memory** – Novel memory devices based on magnetics (e.g. STT, SOT, VCMA), or resistive (selector or memory element) RAM, ferroelectrics, or phase change memory
- **MEMS** – Includes reliability of sensors and actuators; reliability testing; analysis & modeling; BioMEMS

## Preparation of your manuscript

Your **two-page** original abstract submission should clearly and concisely present specific results, and explain the importance of your work in the context of prior work. Use document template available at [www.irps.org](http://www.irps.org). Full manuscripts of accepted papers will be due before the conference. Registration for the conference is required for the author presenting the paper.

### Late Paper Submission

Full-length manuscripts with significant late breaking news submissions **due January 23, 2023**.

### Agreement Not to Pre-Publish Abstracts or Present Abstracts

Submission of an abstract for review and subsequent acceptance is considered by the committee as an agreement that the work will not be placed in the public domain by the author prior to the conference. Accepted papers or significant portions of the work may not be placed in the public domain (conference with and without proceedings) prior to the conference. Violation will be grounds for automatic withdrawal of the paper by the conference committee. All questions or inquiries for further information regarding this meeting should be directed to the **IRPS Contacts**.

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IEEE Meetings, Conferences & Events (MCE)  
445 Hoes Lane, Piscataway, NJ 08854

**Conference Manager:** Lisa Boyd, CMP, CEM, CASE,  
TEL: +1 732 562 6359

**Program Specialist:** Tracy J. Holle  
TEL: +1 732 562 3863

EMAIL: [IRPSplanners@ieee.org](mailto:IRPSplanners@ieee.org)

