IEEE

2023 IEEE INTERNATIONAL RELIABILITY PHYSICS SYMPOSIUM

Call for Papers

March 26st – March 30th 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:** TDDB, 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
- **Product Reliability –** Includes automotive, industrial, commercial, military grade IC/product qualification, HTOL/production burn-in; early failure rate; defect detection; failure analysis; root cause and corrective action, product reliability modeling and risk analysis; on-chip sensors; silicon photonics; multichip/chiplet product, 2D/3D chiplet product, stacked and HBM memory; DFT/DFR solutions for improved reliability; chipset reliability considerations including electrical, environmental, thermal and mechanical risks.
- **System Electronics Reliability –** Reliability of electronic systems used in a variety of applications including but not limited to consumer electronics, data centers, health care, space and automotive industries; architecture, design and modeling of system reliability including "row hammer" scenarios, telemetry data collection and large-scale analysis techniques such as machine and deep learning, and neuromorphic computing.
- **Radiation Effect Reliability (Soft Errors)** – Includes basic mechanism and impact analysis of radiation effects on components and systems; Component, system and application level modeling, simulation, testing, and mitigation techniques for radiation effects induced reliability issues.
- **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, LDMOS, GaN, and other III-V 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_2); 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 electro-migration; Joule heating; stress migration;
- **Process Integration –** Includes mfg process such as PID/charging, anneals/implants etc impact on component reliability, existing and new process-related reliability issues in production; foundry reliability challenges
- **Failure Analysis –** Includes evidence of new failure mechanisms; advances in failure analysis techniques
- **Memory Reliability –** Includes stand-alone DRAM, 3DNAND and embedded memories
- **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

IRPS
International Reliability Physics Symposium

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. 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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