Special Issue

Research Advances in Microelectronics Packaging and Devices: From Materials to Reliability

Message from the Guest Editor

The rapid evolution of integrated circuit technologies has elevated packaging to a pivotal role in enabling next-generation performance, miniaturization, and reliability. Concurrently, AI is reshaping research paradigms, offering unprecedented opportunities for data-driven discovery and optimization.

This issue seeks high-quality contributions exploring cutting-edge developments across the packaging ecosystem—from process innovations to interconnect challenges and from atomic-scale material behavior to system-level reliability insights. Key topics include (but are not limited to):

(1) Three-dimensional heterogeneous integration and advanced interconnect solutions ;

(2) High-power device packaging for automotive, 5G/6G, and power electronics applications;

(3) Material-process-reliability relationships, including novel materials and failure mechanisms under extreme conditions;

(4) Physical and failure analysis of IC;

(5) Uncertainty quantification in reliability modeling and AI/ML-driven approaches for predictive design and accelerated testing.

Let's work together to promote the development of the microelectronic packaging field.

Guest Editor

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Message from the Editor-in-Chief

Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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