ASMC 2027 Call for Abstract Topics

AEPM: Advanced Equipment Processes and Materials
Development of new front- and back-end processes; characterization and integration of conductive materials, barrier layers, advanced gates, high-k and low-k dielectrics, isolators, optical and magnetic materials; evaluation of novel substrates; methodologies for driving new materials from R&D to mass production.

AM: Advanced Metrology
Development and deployment of innovative metrology methodologies, from lab to HVM readiness. Extension for next-generation materials, substrates, process technologies, and device architectures across leading-edge, specialty, and advanced packaging applications. Integration of virtual metrology, hybrid metrology approaches, and AI/ML-enabled solutions.

APC: Advanced Process Control
Advanced control techniques such as run-to-run control; model-based control; non-linear control methods; application of advanced statistical methods to control; advanced SPC techniques; fault detection and classification (FDC); virtual metrology; machine learning and artificial intelligence (ML/AI) monitoring and control.

DFM: Defect Free Manufacturing
Removing defects via improvements in raw materials, chemicals, gases and parts manufacturing as well as Fab and Assembly process set-up technique and choice of materials or process integration. Also innovations in clean room, equipment design and maintenance as well as wafer movement and storage. Activities may be based on AI modeling and experimentation.

DI: Defect Inspection and Reduction
New brightfield, darkfield, e-beam and other techniques and technologies for cost-effective yield control; process development using defect detection and management; new methodologies for detection, characterization, classification and disposition of defect counts, types and distributions; diagnostic techniques to correlate in-line inspection results to product yield and defectivity.

DM: Big Data Management and Cybersecurity
Fab and test floor data collection methods and analysis; data format, volume, interface, and security challenges; fast drill-down to problem tools and sources; foundry-to-fabless data transfers, information management, and protection issues; new visualization methods for improved data understanding; applying data mining, artificial intelligence, and machine learning approaches to isolate, secure, and utilize critical information from large data volumes. Topics include secure architectures for manufacturing environments, threat detection, cloud security, device traceability, data ownership, and best practices for safeguarding product, operational, and intellectual property data.

EO: Equipment Optimization
Efficiency and productivity measurements; optimizing and extending fab productivity within the framework of existing wafer sizes; cycle time and cost reduction; best practices; customer-supplier continuous improvement programs; CMP development; high-mix/high-volume factories with high equipment productivity; small-lot manufacturing and single-wafer/mini batch tools; fab conversions; equipment modification and maintenance strategies; integration of factory control systems into complete supply chain; AI/ML applications for equipment performance, reliability, maintenance, and productivity.

MS: Manufacturing for Sustainability
The role of environment; health and safety; emissions and effluents control; energy saving; recycling; safety and health; community involvement; ergonomics; zero emission; global environment protection; waste reduction; sustainability; Establishing lean manufacturing flow; standards and standard work; value stream mapping; Kaizen; Kaikaku; cycle times; 5S; continuous improvement; metrics, training within industry (TWI); leveraging of artificial intelligence to improve sustainability.

NDT: Novel Device Technologies
Novel and emerging process techniques, quantum computing, quantum sensors, radiation imaging, harsh environment, 3-D logic scaling with nano-structures; Silicon Carbide (SiC), Gallium Nitride (GaN), Gallium Arsenide (GaAs), Indium Phosphide (InP), glass, quartz and other non-silicon wafers, heterogenous devices, analog/mixed signals, power devices, automotive, flexible substrates, display drivers, analog, sensors. Micro-electro-mechanical systems(MEMS), Phase Change Memory (PCM), photonics, magnetic heads, micro displays, sensors, Digital Light Processing (DLP), Magnetic Random Access Memory (MRAM), organic semiconductors, silicon modulators, novel structures, carbon nanotube, graphene, interconnects.

PDTO: Patterning, Design & Technology Optimization
Immersion, multiple patterning, EUV lithography; resolution enhancement techniques; source/mask optimization; overlay enhancement; edge placement error; advanced reticles; alternative patterning methods; directed self-assembly; feed-forward control; volume manufacturing effects on patterning; computational lithography; AI/ML-enabled lithography optimization and process control; process models; optical proximity correction; design rule incorporation; DFM in yield learning through product cycle; early manufacturing involvement; integrated product and process development (IPPD). Design and Technology Co-optimization (DTCO); power, performance and area (PPA) optimization.

SM: Smart Manufacturing & Factory Operations
Automation, industrial engineering, and smart manufacturing solutions for semiconductor fab, probe, assembly, and test operations. Topics include factory and manufacturing systems design; equipment and AMHS integration; WIP, scheduling, logistics, capacity, and supply chain management; modeling, simulation, digital twins, industrial IoT, robotics, sensors, cloud-enabled applications, and AI-driven analytics; remote operations; quality, statistics, human factors, standards, and system integration; and data-driven approaches to improve productivity, cycle time, cost, safety, sustainability, and operational performance.

WFD: Workforce Development
Inviting abstracts from industry experts, hiring managers, and HR professionals on workforce development across the semiconductor manufacturing supply chain, including best practices, case studies, and industry–academia–government partnerships. Topics may include talent acquisition, retention, organizational learning, training methodologies, knowledge transition, systematic upskilling for out-of-industry talents, academic–industry collaboration, and workforce management in an industry with highly cyclical demand.

WLP: Wafer Level Packaging
Advanced bonding techniques such as wire bonding, flip chip bonding (bump metallization), micro-bump bonding, C4 new process; wafer-to-wafer bonding, die-to-wafer bonding, hybrid bonding and cleanliness; through-wafer vias (TSVs), interposers, silicon carriers, panel-level processing; global/local interconnect solutions, power delivery, thermal management, high-density interconnects; plasma dicing, laser dicing, deep etching, backgrinding; solderable top metal, back metal, redistribution layer (RDL) design, process interactions, polyimide options, delamination control, and AI/ML applications for advanced packaging, process optimization, defect detection, and yield improvement.

YE/YM: Yield Enhancement/Learning and Methodologies
Yield analysis tools and methods, including identifying root cause of yield loss and reliability fails; failure analysis; defect-to-yield correlation; zonal and spatial pattern analysis; slot signature analysis; use of volume diagnostics for pinpointing net failures; determination of critical particle size and types. Yield monitoring and modeling accuracy; model types; critical area extraction techniques; yield-targeted data mining; modeling of systematic and parametric yield; process sector analysis; short-flow yield programs, including machine learning and artificial intelligence (ML/AI) based algorithms for Yield enhancement.