

WELCOME

The GOMACTECH-10 Program Committee is pleased to welcome you to this year's conference in Reno, Nevada. GOMACTECH is the pre-eminent conference for the review of developments in microcircuit applications for government systems. GOMACTECH was established in 1968 and is an unclassified, Export-Controlled event that requires all participants to be U.S. Citizens or legal U.S. Permanent Residents. Historically, the Conference has been the venue to announce major government microelectronics initiatives such as VHSIC, MIMIC, and others. This year also marks a new milestone for the technical breath of GOMACTECH. We welcome the participation of this technical community.

This year's conference theme: "Microelectronics for Net Enabled and Cyber Transformational technologies" provides a forum that highlights the concept of net-enabled operations as a cornerstone for our national defense posture. The underlying assumption of this vision is the availability of robust, reliable, secure information and communications infrastructures. As government and civilian activities develop net-enabled technologies, the national defense communications infrastructure becomes an increasingly attractive target for adversary nation states in both covert and overt operations. The demand for microelectronics is imperative for developing trustworthy, high bandwidth, and high speed, nano-scaled electronics to realize the vision. GOMACTech-10 provides a forum for discussing and demonstrating advanced microelectronics that can provide the transformational, leap-ahead technologies to protect our communication networks from cyber attacks. Topics that support this vision are highlighted at this year's conference.

The conference will follow the successful format used over the past several years, with both technical and topical sessions. The technical sessions comprise contributed and solicited papers, including oral presentations and a Thursday morning poster session. A special section of the student poster session and competition will highlight the work of student contributors. The topical sessions will focus on a broad range of developments and accomplishments ranging from components to systems within selected ongoing government-sponsored programs. Some of this year's topical session themes are:

- Microelectronics for Trustworthy Information Systems
- Wireless Communications and Network Technologies
- Nanoelectronics and Nanosensors
- Wide Bandgap Electronics
- Ultra-Low Power Electronics and Sources
- Electro-Optical Technologies
- Analog to Digital Components and Systems
- Broadband Multifunction RF Systems
- Circuits and Devices
- Advanced Packaging and Interconnect Technologies
- Radiation Hardened Microelectronics Technologies
- Power Electronics
- Reconfigurable Electronics
- Sensor C-SWAP
- Advanced Antenna Arrays
- Space Environment Modeling and Monitoring
- Metamaterials

The first tutorial is the first national Trusted Suppliers meeting. The objective is to gather members of industry and government agencies representing the interests of integrated circuit and electronics producers who are focused on serving Defense and Aerospace applications which are trusted. This summit is organized by Harry Kelzi of Teledyne. This daylong event will bring together suppliers who have been accredited as trusted in order to discuss critical issues facing this emerging community. Some of the key issues to be discussed include accreditation activity and criteria, emerging defense policy and demand for trusted supplies, trust solutions and opportunities for industry to work together and with government for further progress in this area.

The early part of the day will focused government representatives providing status and updates on DOD policy, the accreditation process and programmatic initiatives. Later in the morning on industry representatives will discuss their capabilities, services that serve the industry OEMs as well in supplying prime contracts to the Defense and Aerospace marketplace. The afternoon session will convene a moderated panel discussion representing both industry and Government that will take on topics that are frequently being asked by industry participants.

Organizations that are accredited by the time of the Summit are invited to participate as presenters at the Summit. Although the summit is open to all attendees, suppliers who are planning to become a certified Trusted Supplier, are urged to attend as this event will be of utmost interest and beneficial to your organization in understanding, promoting and networking with the Trusted Suppliers community.

In addition, two outstanding tutorials are offered on Monday with the cost included as part of the conference registration fee. The first tutorial titled, "Anti Tamper", is organized by Dr. Robert Cunningham, Information Systems Technology Group, MIT Lincoln Laboratory and Dr. Ted Lyszczarz, Submicrometer Technology Group, MIT Lincoln Laboratory. Tamper-resistant systems and anti-tamper techniques are important for ensuring that systems, the data they collect and the control signals they emit are used as intended. The US requires anti-tamper technology for military systems that we sell to our closest allies, to ensure that the ally can use the system, but not duplicate it. Commercial applications are important as well -ATMs, satellite TV boxes, cellular telephones, and video game consoles are only a few examples. In both DOD and commercial applications, designers, producers and operators need to cooperate to thwart potential reverse-engineering attacks. This half-day seminar will cover an approach to protect systems and the data they process and produce. The approach rests on a combination of policy, legal and technical techniques. We will discuss some of the policy and legal issues, and focus on the technical techniques. The tutorial will motivate the need for anti-tamper techniques, drawing from commercial and DOD systems that have been attacked and illustrating the level of effort adversaries will invest in reverse-engineering. The tutorial also covers threat modeling, cryptography and side-channel attacks, and approaches to determine what needs to be done to protect the system from attack. The tutorial will finish with a discussion of gaps in the space.

The second tutorial titled, "The Re-emerging Need for 'MILSPEC' Parts: Escalated Design Costs", is organized by John Penn, Army Research Laboratory, Adelphi, MD. The primary enabling technology for C4ISR over the past 40 years has been integrated electronics. However, the decisions made over 15 years ago to leverage commercial off the shelf (COTS) parts nearly eliminated the demand for integrated circuits specialized for the military environment. Holding less than 1% of the global market for IC's, the majority of production capital and design intellectual property has migrated offshore. Nonetheless, the need remains for critical portions of the electronic design to be performed in a custom manner. In the meantime, design tool costs have continued to escalate as feature size and device densities have increased. Reconciling these

cost challenges with design criticality and throughput will initiate opportunities for novel business/enterprise strategies.

The conference formally opens on Tuesday morning with an outstanding Plenary Session including a Keynote presentation by The Honorable Zachary Lemnios, Director, Defense Research and Engineering. Following the Keynote, there will be three Kilby Lecture speakers: Mr. Greg Gardner, Deputy Chief Information officer, United States Intelligence Community; Dr. Wilfried Haensch, Senior Manager Advanced Si Devices and Explorative Technologies IBM TJ Watson Research Center; Col. Barry Shoop, as Professor of Electrical Engineering and Deputy Head of the Department of Electrical Engineering and Computer Science at the United States Military Academy.

The Plenary, Technical, and Topical Sessions are the major venues for information exchange at the conference. Other opportunities for technical interaction are provided through the Exhibit Program that includes major IC manufacturers and commercial vendors of devices, equipment, systems and services for nearly all facets of the electronics business. The exhibition opens on Tuesday at noon and runs through Wednesday at 4:00 PM. On Tuesday evening, attendees can mix in a relaxing atmosphere of food and good spirits at an Exhibitors' Reception. The Wednesday Luncheon Keynote speaker will be Dr. Kevin Kit Parker, Thomas D. Cabot Associate Professor of Applied Science Associate Professor of Biomedical Engineering School of Engineering and Applied Sciences Harvard University. Wednesday evening features the conference banquet, which this year will be held at the National Automobile Museum, followed by a show by the world-renowned "Galileo Players". On Thursday morning, there will be a poster session and for the first time a student poster competition. The Thursday Luncheon Keynote speaker will be Mr. James Gosler, Fellow - Sandia National Laboratories-formerly the Director of the Clandestine Information Technology Office at CIA.

This year's strong technical program reflects the hard work and enthusiasm of the GOMACTECH-10 Technical Program Committee. The committee members aggressively sought out particular topics and areas for presentations, and the quality of the conference certainly reflects this effort. It is our hope and belief that GOMACTECH-10 will be a rewarding experience for all participants. We appreciate your support.

Chris Lesniak
Conference Chair

John Franco
Technical Program Chair