2017 AMTA/IEEE REGIONAL SYMPOSIUM EVENT

ADVANCE PROGRAM & REGISTRATION FORM

The Antenna Measurement Techniques Association (AMTA)

in cooperation with the

THE UNIVERSITY OF ALABAMA IN HUNTSVILLE
Department of Electrical and Computer Engineering

IEEE Huntsville Electromagnetic Compatibility Society Chapter & the Joint Antennas and Propagation/Microwave Theory & Techniques Chapter

Proudly Presents

Hardware-in-the-Loop

Thursday, May 18, 2017

CTC Exhibition Center
1410 Ben Graves Dr NW
Huntsville, AL 35816

PROGRAM AGENDA

7:30 am	**REGISTRATION & CONTINENTAL BREAKFAST**
8:30 am	**IEEE/AMTA Welcome** *Mr. Steve Nichols, NSI-MI Technologies, AMTA Past President* *Dr. Maria Pour, Assistant Professor, UAH ECE Department* *Ms. Michelle Taylor, AMTA 2017 Host Chair*
9:00 am	**Developments of mm-Wave Automobile Pre-Collision System (PCS) Radar Testing Surrogates and Procedures** *By Dr. Chi-Chih Chen, PhD, Research Associate Professor, Electrical & Computer Engr.*
9:40 am	**The 7 Common Habits of Highly Effective RF Target Simulators** *By Mr. David Wayne, Vice President, Target Simulation Systems, NSI-MI Technologies*
10:20 am	**BREAK**
10:50 am	**Electromagnetic Simulation Tools for Advanced Driver Assistance Systems** *By Dr. CJ Reddy, VP Business Development – Electromagnetics, Altair*
11:30 am	**5G Wireless and Automotive Technology – Driving the Need for Hardware-in-the-Loop Antenna Testing** *By Mr. Per Iversen, President/CEO, MVG – Orbit FR Division*
12:10 pm	**LUNCH**
1:15 pm	**Multi-Object RCS/Trajectory Simulation Data Infused into Real-Time TSPI Radar Processor** *By Dr. Jerry Jost, Owner, President, & CEO, Star Dynamics*
1:55 pm	**Naturally Compressive Noise Radar Using Chaos** *By Dr. Aubrey Beal, US Army Research, Redstone Arsenal*
2:35 pm	**BREAK**
2:55 pm	**Extremely High Frequency Technologies for Imaging Radar & High-Bandwidth Datalinks** *By Dr. Martin Heimbeck, Research Scientist, Redstone Arsenal*
3:35 pm	**Adaptive Electromagnetics – Closed-Loop Demonstrations of Reconfigurable Antennas** *By Dr. Ryan Westafer, Chief Scientist, Electromagnetics Division, Advanced Concepts, GTRI*
4:15 pm	**CONCLUDING REMARKS** *Mr. Dave Pinnell, AMTA President*
4:45 pm to 5:45 pm	**RECEPTION WITH SPEAKERS AND EXHIBITORS** **Raffle Prize Drawings**
Friday (TBD) May 19	**TECHNICAL TOUR OF REDSTONE ARSENAL**

TECHNICAL PROGRAM
PRESENTATION ABSTRACTS

Developments of mm-Wave Automobile Pre-Collision System (PCS) Radar Testing Surrogates and Procedures
By Dr. Chi-Chih Chen, PhD, Research Associate Professor, Electrical & Computer Engr.

Abstract: More and more new cars are equipped with automatic emergency braking (AEB) systems for improving road safety by using on-board sensors such as cameras and radars to detect objects on roads. In particular, there have been a large number of fatal crashes involving pedestrians and bicyclists. However, the effectiveness of PCS systems in detecting pedestrians and bicyclists cannot be objectively verified due to lack of standard test targets and protocols. Currently, the European Union has established some test protocols, such as the Euro New Car Assessment Program (NCAP) AEB and AEV-VRU (vulnerable road user), which are currently being evaluated by NHTSA and yet to be adopted by international community. The current test protocols are only for vehicle targets and pedestrians, with a plan to include protocols for bicyclist detection in the near future. The key elements of these standard AEB test protocols are the standard test targets, or surrogates that are able to produce similar sensor responses as real-life cars, pedestrians, and bicycles. In addition, such standard targets must also be able to withstand the impacts from the vehicle under test (VUT) without damaging the VUT and be easily reassembled and reused after impacts. This talk will discuss the designs and performance of the vehicle, pedestrian, and bicyclist surrogates developed for evaluating 76-77GHz PCS radars, as well as the related test protocols.

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The 7 Common Habits of Highly Effective RF Target Simulators
By Mr. David Wayne, Vice President, Target Simulation Systems, NSI-MI Technologies

Abstract: The evaluation of RF Sensors often requires a test capability where various RF targets are presented to the Unit Under Test (UUT). These targets may need to be dynamic in time, represent multiple targets and/or decoys, emulate dynamic motion, and simulate real world RF environmental conditions. An RF Target Simulator can be employed to perform these functions and is the focus of this paper. The total test system is usually called Hardware in the Loop (HITL) involving the sensor mounted on a Flight Motion Simulator (FMS), the RF Target Simulator presenting the RF Scene, and a Simulation Computer that dynamically controls everything in real time. The realization of a highly effective target simulator, one that truly meets the user's needs at an affordable cost, is the result of understanding the complex interrelationship of requirements, architecture and constraints. In this presentation, those relationships are examined in seven areas of discussion, employing examples of realized systems;

- Determining the necessary test zone volume
- Determining the necessary quality of RF target signal
- Sizing the field of view, range and facilities
- Creating each target's RF signal
- Creating RF target motion
- Integration and real-time operation within the range
- Locating and minimizing the effects of error sources.

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Electromagnetic Simulation Tools for Advanced Driver Assistance Systems
By Dr. CJ Reddy, VP Business Development – Electromagnetics, Altair

Abstract: Automotive OEMs are moving towards the inclusion of several safety systems, which are covered by several sensors. Many new functions are being added to assist the driver to avoid accidents that might be caused by different road scenarios. The new ADAS (Advanced Driver Assistance Systems) systems are mainly: lane change assistants (LCA), blind spot detection (BSD), pedestrian recognition, collision avoidance and pre-crash functions, cross traffic alerts and parking assistance. Automotive Collision Avoidance Radars are approved to operate in 76-77GHz. Radar design and integration at such high frequencies is very challenging. As a result, electromagnetic (EM) simulation is now more often applied as it helps to avoid time consuming and expensive prototyping cycles for the radar manufacturer and a complex radar integration behind a car‘s bumper for automotive OEMs. In this talk, a details design process for automotive radar design and integration will be presented using advanced EM simulation techniques. Also, this talk will present simulations of radar channel and the environment for better understanding of the functioning of the radar in real driving scenarios.

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5G Wireless and Automotive Technology – Driving the Need for Hardware-in-the-Loop Antenna Testing
By Mr. Per Iversen, President/CEO, MVG – Orbit/FR Division

Abstract: Microwave and millimeter wave phased array antennas are now highly integrated and include adaptive beam steering through array signal processing for both defense and commercial wireless applications. Although, the "hardware in the loop" term was previously reserved for defense applications such as RADARs, adaptive antennas and direction finding systems, the new 5G mobile communications networks and new automotive applications will also employ integrated phased array and embedded controls that do not allow for testing via cabled connections. Hence, HIL techniques become necessary to effectively characterize the radiated performances of such devices. This paper will present various concepts used for HIL antenna system testing and will draw on that experience to pose some of the challenges industry will have to characterize these new generation of mass produced antennas

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Multi-Object RCS/Trajectory Simulation Data Infused into Real-Time TSPI Radar Processor
By Dr. Jerry Jost, Owner, President, & CEO, Star Dynamics

Abstract: The commercially available XSTARTM flight test range multi-object Time-Space-Position Information (TSPI) instrumentation radar system supports true-time-rate mission data playback through its real-time track processor, providing efficient and quick-look post-mission analysis of TSPI data. This feature is typically used to re-assess mission results using differing target detection thresholds or track initiation algorithms relative to those used during actual data acquisition. Similarly, this feature enables detailed post-mission evaluations of data rich events or unusual events that occurred during flight testing. However, other functions of this real-time data playback capability include (1) pre-mission planning and generation of system control files for automated target track sequencing during nominal test scenarios, (2) operator training in preparation of complex tests, such as, planning for operator intervention for test anomalies, and (3) real-time processing of hybrid data sets consisting of real-world target data infused with simulated target signature and trajectory data injected into the raw data stream of the real-time data processing system. As a Hardware-in-the-Loop (HWIL) simulator, this third function, the subject of this paper, supports rehearsal, validation, and training for complex test mission scenarios using minimal “dry run” flight resources, as well as supporting verification testing of alternative signal processing and tracking algorithms.

This paper presents details on the development and processing of hybrid radar data sets, and presents displays of original, real data and then when it has been fused with targets synthesized with realistic time-dependent RCS and flight-path signatures. The unique challenges that hybrid data presents to the real-time XSTARTM track processor are also discussed as illustrative examples. These examples demonstrate the utility of a highly digital, phased array, multi-object TSPI instrumentation radar for cost effective test preparation resulting in higher mission success rates.

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Naturally Compressive Noise Radar Using Chaos

By Dr. Aubrey Beal, US Army Research, Redstone Arsenal

Abstract: Chaos is a deterministic phenomenon that causes unpredictable oscillations. It has been shown that chaos has a surprising and necessary role in optimal waveform detection when simple matched filters are used. This result paired with the noise-like behavior of chaotic systems encourages their candidacy for noise radar systems. This work outlines the benefits of using solvable chaos to realize a noise radar scheme that consists of simple components, optimal detection of the transmitted waveform and sub-Nyquist sampling. The result is a noise radar system that is inexpensive, easy to characterize and has potential for less demanding memory, sampling and power requirements. A treatment of noise radar, simple matched filters for chaos and natural compressive sampling of chaotic signals is provided.

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Extremely High Frequency Technologies for Imaging Radar & High-Bandwidth Datalinks

By Dr. Martin Heimbeck, Research Scientist, Redstone Arsenal

Abstract: Millimeter wave and Terahertz (sub-millimeter wave) radiation are emerging technologies with many applications ranging from imaging radar for nondestructive testing and security screening to high-bandwidth datalinks as a wireless alternative to fiber optics and robust alternative to free space optical datalinks. However, as an emerging technology, the availability of commercial products to support the development of these extremely high frequency applications is limited. Test instrumentation to include antenna products and absorbing materials are hard to find as a product line, and turnk-key instrumentation is still highly specialized and usually offered only by a small size of businesses trying to fill a product niche. In this talk, several promising applications for coherent millimeter wave and Terahertz radiation to include holographic imaging, coherent tomography, radar signature studies, and high-bandwidth datalinks will be presented along with supporting instrumentation ranging from compact radar ranges, system-on-chip technology, ellipsometers, inexpensive absorbers, metamaterials, sources and heterodyne detectors.

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Adaptive Electromagnetics – Closed-Loop Demonstrations of Reconfigurable Antennas

By Dr. Ryan Westafer, Chief Scientist, Electromagnetics Division, Advanced Concepts, GTRI

Abstract: Over more than a decade of research and development, reconfigurable antennas have been characterized and demonstrated in several different closed loop systems. These antennas typically are wavelength-sized single-feed apertures capable of tuning over an octave in frequency, reaching any point on the Poincaré sphere, and steering in two dimensions. Prior to the DARPA RECAP program in 1999, genetic algorithms were used to optimize pixelated or “fragmented aperture” antennas in simulation, i.e. prior to construction. Since that time, electronically reconfigurable antennas have been optimized in situ using closed-loop measurement systems. This approach produces optimized personalities accounting for variations in manufacturing. Such measurement systems are general purpose and precise but relatively slow. Fortunately, the increasing popularity and availability of software defined radio equipment since 2004 has enabled higher speed closed loop demonstrations taking advantage of baseband processing. The increase in speed and cooperation with radio hardware has enabled real-time closed loop control ranging from multi-mode operation to blind adaptation to propagation channels. This talk describes several systems, results, and demonstrations conducted recently at GTRI.

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SPEAKER BIOGRAPHIES

Chi-Chih Chen, PhD: Dr.Chi-Chih Chen received his Ph.D. degrees in Electrical Engineering in 1977 from The Ohio State University. He has been with The OSU ElectroScience Lab since 1993 as a Postdoctoral Researcher (1997~1999), Senior Research Associate (1999-2003) and Research Scientist in (2004~2011). He became a Research Associate Professor at The Ohio State University ECE Department since 2011.

Dr. Chen's research areas include ground penetrating radars, automobile radars, ultra-wideband antennas, small antennas, dielectric antennas, GPS/GNSS antennas, wearable antennas, phase array antennas, RF energy harvesting, and wireless charging. Dr. Chen is the co-founder of two start-up companies. Dr. Chen has published 59 journal papers, 167 conference papers, 5 book chapters, 1 co-authored book, more than 80 technical reports, and 5 patents.

Dr. Chen has been a member of AMTA since 1997 and was elected a member of the Board of Directors. He served as AMTA Technical Coordinator (2012-2013), President (2014), and Past President (2015), and has been serving on the Technical Program Committee and Session Chairs for many years. He also served as Treasurer, Vice Chairman and Chairman of IEEE Joint AP/MTT Columbus from 2001 to 2003, Technical Chair of 2006 International Ground Penetrating Radar Conference for which he has been serving on the International Advisory and Science Committee. He is currently a member of SAE Active Safety Pedestrian Test Mannequin Task Force and SAE Active Safety Test Target Validation and Correlation Task Force. Dr. Chen has been serving on the Technical Program Committee of IEEE APS/URSI Symposiums, IEEE Phase Array Symposiums, IEEE IGARSS Symposiums. Dr. Chen received OSU College of Engineering Lumley Research Award in 2005, 2010, and 2015. He is an AMTA Fellow, IEEE Fellow, member of Exploration Geophysicists Society, Sigma Xi, and Phi-Kappa-Phi.

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David Wayne, NSI-MI Technologies: Dave Wayne is Vice President at NSI-MI responsible for management of the Target Simulator Business area. The responsibilities include setting strategy for new business capture and oversight of existing programs and orders. Dave joined the company in Aug 2003 serving for 12 years as the Vice President of Engineering managing the Company's design, analysis, test and documentation of the company's products.

Prior to joining NSI-MI, Dave held executive positions of various scope and responsibility in technology based companies. Dave was the General Manager and Chief Operating Officer of Avionics Displays Corporation responsible for managing the day-to-day operation of the company and meeting the company financial goals. It involved the design and manufacture of LCD cockpit instrumentation for aircrafts and vehicles. He was the Director of Operations for Advanced Control Systems responsible for program management, engineering, manufacturing, purchasing and quality which designed and delivered Supervisory, Control and Data Acquisition (SCADA) systems to Electric Utilities. Dave started his career at Rockwell International which later became part of the Boeing Corporation. In his 23 years at Rockwell/Boeing, Dave started as an electronic/software/systems design engineer and progressed through increasing responsible manager positions including manager of electrical design, software & digital signal processing, systems engineering and advanced programs, to the executive position of Director of Engineering for missile programs where he was responsible for 700 engineers. Technologies included infrared, laser and RF sensors, digital signal processing, terminal homing, inertial guidance, propulsion, warheads, target detection, fire control and systems integration and test.

Dave has been a member of the Antenna Measurements Techniques Association (AMTA) for 14 years, publishing several papers about RF target simulation and compact range performance. Dave holds a Master of Science Degree in Electrical Engineering from the Ohio State University and a Bachelor of Electrical Engineering Degree from the University of Cincinnati.

CJ Reddy, PhD, Altair: Dr. C.J. Reddy is the Vice President, Business Development-Electromagnetics for Americas at Altair Engineering, Inc.(www.altair.com). At Altair, he is leading the marketing and support of commercial 3D electromagnetic software, FEKO (http://www.altairhyperworks.com/product/FEKO) in Americas. Dr. Reddy is also the President of Applied EM Inc (www.appliedem.com), a small company specializing in innovative antenna design and development. At Applied EM, Dr. Reddy successfully led many Small Business Innovative Research (SBIR) projects from the US Department of Defense (DoD). Dr. Reddy is a Senior Member of Institute of Electrical and Electronics Engineers (IEEE) and also a Senior Member of Antenna Measurement Techniques Association (AMTA). He has been elected Fellow of the Applied Computational Electromagnetic Society (ACES) in 2012. Dr. Reddy served on ACES Board of Directors from 2006 to 2012 and is currently serving as the Secretary of ACES. He published 37 journal papers, 77 conference papers and 18 NASA Technical Reports to date. Dr. Reddy is a co-author of the book, "Antenna Analysis and Design Using FEKO Electromagnetic Simulation Software," published in June 2014 by SciTech Publishing (now part of IET). Dr. Reddy was the General Chair of ACES 2011 Conference held in Williamsburg, VA during March 27-31, 2011. And also ACES 2013 conference, Monterey CA (March 24-28, 2013) as well as the General Chair of ACES 2015 conference held in Williamsburg, Virginia during March 22-26, 2015. He was the Co-General Chair of 2014 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting held during July 6-11, 2014 in Memphis, TN. Dr. Reddy is the General Chair for AMTA 2018 conference to be held in Williamsburg, Virginia during November 3-8, 2018.

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Per Iversen, MVG: Mr. Per O. Iversen, MSEE, is the CEO, MVG-ORBIT/FR Inc., Horsham, Pennsylvania. Mr. Iversen has more than 25 years of experience in applied electromagnetics and antennas. He is a senior member of AMTA and has served on its Board of Directors of AMTA as Secretary and Vice President. He is a regular lecturer for the UCLA Extension course on "Modern Microwave Antenna Measurements". Mr. Iversen has co-authored numerous papers principally related to multiprobe antenna measurement and is currently involved in developing test systems for 5G and millimeter-wave antenna applications.

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Jerry Jost, PhD, Star Dynamics: Dr. Jerry Jost is the Owner, President and CEO of STAR Dynamics Corporation. Following a tour of duty with the U.S. Army and tenure with NASA Johnson Space Center as an ionospheric research scientist, Dr. Jost has gained more than 40 years of experience in numerous national defense technology disciplines including Radar Systems Design and Radar Measurement Science. As proprietor of STAR Dynamics, a Veteran Owned Small Business sustaining a thirty-year history, he directs all research and development projects for this advanced-technology company specializing in precision instrumentation radar technology and special-purpose electromagnetic propagation systems for both defense-related and civil applications. Dr. Jost's professional pedigree has been predominately established through radar technology inventions, U.S. Government Small Business Innovation Research (SBIR) awards, and defense contracts associated with defining and developing state-of-the-art, precision signature and ultra-wideband (UWB) imaging radars for static and dynamic operations, as well as cutting-edge, Time-Space-Position Information (TSPI) precision, multiple-object, tracking instrumentation radars. Dr. Jost has led multiple and diverse Government-funded technology development programs, commercial technology product development efforts, and fundamental research investigations associated with electromagnetics.

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Aubrey Beal, PhD, Redstone Arsenal: Dr **Aubrey Bea**l received B.E.E., M.S. and PhD degrees in Electrical Engineering from Auburn University in Auburn, AL. He has industry experience in bulk power systems with Southern Company, power electronics for high performance computers with IBM as well as metal detection for biomedical applications. Dr. Beal currently holds an appointment by the U.S. Department of Energy's Oakridge

Institute for Science and Education as a post-doctoral researcher with the U.S. Army Charles M. Bowden Laboratory at Redstone Arsenal, Alabama. His current research interests include nonlinear dynamics and chaos for applications in communications and radar."

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Martin Heimbeck, PhD, Redstone Arsenal: Dr. Martin Heimbeck received his M.S. and Ph.D. degrees in Physics and Optical Science and Engineering from The University of Alabama in Huntsville, Huntsville, AL in 2008 and 2016 respectively. Dr. Heimbeck conducts basic and applied research activities at the Charles M. Bowden Research Laboratory in the Army's Aviation & Missile RD&E Center located at Redstone Arsenal, AL, USA. His research interests include millimeter wave research at 60 GHz for communication applications and extremely high frequency (100 - 1000 GHz) research for coherent imaging radar applications including digital holography and computational tomography."

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Ryan Westafer, PhD, GTRI: Dr. **Ryan Westafer** is a Senior Research Engineer and Chief Scientist of the Electromagnetics Division of the Advanced Concepts Laboratory (ACL) at Georgia Tech Research Institute (GTRI). He received the BS (CMPE), MSECE, and PhD (EE) degrees from Georgia Tech, with a research focus in dispersion engineering of surface waves in piezoelectric phononic crystals for a multiplexed passive RF backscatter sensor. Since joining GTRI, Ryan has supported or led many programs ranging from RF devices to antenna applications. Most recently, he has served as lead engineer of GTRI’s team creating a Reconfigurable Electromagnetic Interface (REI) for the DARPA ACT program. Ryan’s ongoing research interests include optimized W-band apertures and full-wave simulation of time-varying antennas and systems.

2017 AMTA/IEEE REGIONAL SYMPOSIUM EVENT OVERVIEW

The Program

This program was designed to bring the latest technology related to antenna measurement techniques, radar, antennas, and EMC to the local community. Experts in industry, academia and government organizations will share practical information on various topics in an extended presentation format. This allows a thorough discussion of each topic and provides the opportunity for extended questions and answers. The "hands-on" quality of the presentation enables the registrant to learn useful information that can be used on the job – in the "real world." The demonstrations provide a unique educational opportunity to see selected presentation material "live".

The Exhibition & Reception

There will be an exhibition by vendors of test and measurement related products and services for antenna, wireless, and EMC applications in a ballroom neighboring the technical presentation area. These products and services address the needs of the commercial, military, and aerospace industries. During the reception from 4:45 to 5:45 pm in the exhibit area, heavy appetizers and a hosted bar will be available. AMTA and IEEE members are welcome to attend the reception only at NO CHARGE, provided a registration form is completed and sent in advance. A badge will be available for the reception-only attendees upon arrival at 4:45 pm. *Thus, if you can't join us for the entire day, drop by for the reception and exhibition to network with AMTA and IEEE. You can see demonstrations, meet the speakers, and you might even win a raffle prize!*

Event Location

CTC EXHIBITION CENTER
University of Alabama Huntsville (UAH) Campus
1410 Ben Graves, Dr NW, Huntsville, AL 35816
Phone: 256.824.1502 or 256.824.6445
Email: chargerevents@uah.edu or acostak@uah.edu
http://www.uah.edu/ctc/

Local Hotels

Many options exist for lodging close to the CTC Exhibition Center on the UAH campus.

Technical Tour of Redstone Arsenal

Friday, May 19, 2017

A tour of facilities at the Redstone Arsenal in Huntsville is available on Friday morning (exact times TBD). The number of attendees will be limited, and registration must be completed by April 30 to be considered. Attendees will be required to provide their own transportation to the Redstone Arsenal facility. Please indicate your interest on the registration form.

ORGANIZING COMMITTEE

Donnie Gray – AMTA BoD Meeting Coordinator, Donald.Gray@mvg-us.com
Dr. Maria Pour – Local Host, Professor UAH, Maria.Pour@uah.edu
Dennis Lewis – AMTA BoD VP, Dennis.M.Lewis@boeing.com
Michelle Taylor – AMTA 2017 Host, Host@amta.org
Dirk Heberling – AMTA BoD Technical Coordinator, Technical-Coordinator@amta.org
John Estrada – Past AMTA BoD VP, John.Estrada@mvg-us.com
Mike Francis – AMTA BoD Senior Advisor, Mike@amta.org

UAH & IEEE Huntsville Liaison

Dr. Maria Pour, Maria.Pour@uah.edu

Sponsorships and Exhibits

Michelle Taylor, NSI-MI Technologies
Office: 678-475-8345, Email: host@amta.org

Registration

Please register through the AMTA Website at: www.AMTA.org or use the form on the following page.
For Questions, contact Donnie Gray
Office: 678-797-9172, Email: meeting-coordinator@amta.org

REGISTRATION FEES	
AMTA/IEEE Members, if received by **April 21, 2017**	**$155**
AMTA/IEEE Members if received from **April 22 – May 12, 2017**	**$225**
AMTA/IEEE Members, after **May 12, 2017 and On-Site**	**$275**
Non-Member Additional Charge*:	**$ 50**
Full-time Students with copy of valid Student I.D., if received by **May 12, 2017**:	**$ 20**
NOTE: Unemployed/retired attendees will receive a 50% discount off the AMTA/IEEE Member fees above.	
*Includes one year membership in AMTA.	

NOTE: *The registration fee includes a flash drive of the colloquium record, continental breakfast, lunch, refreshment breaks, and the reception. The organizing committee reserves the right to substitute speakers, restrict size, or to cancel the colloquium and exhibition. In the event the organizing committee cancels this event, registration fees only will be fully refunded. Individuals canceling their registration prior to April 30, 2017 will receive a full refund, less 10% credit card fee. No refunds will be made to individuals who cancel their registration after April 30, 2017. Substitutions are allowed. Attendance is limited; registration will be confirmed on a first come, first served basis.*

Registration Information

Please print clearly

Name: _____

Title: _____

Company: _____

Street Address: _____

City: _____ **State:** _____ **Zip:** _____

Daytime Phone: _____

E-mail Address: _____

AMTA or IEEE Member: Y___ N___

IEEE #: _____

Full-time Student: Y___ N___

School: _____

(Please attach copy of Student ID to obtain Student rate.)

Do you plan to attend the Redstone Arsenal Tour on Friday? **Y___ N___**

Registration Total per Fees Above

Check Enclosed in Amount of: $_____
(Checks payable to: AMTA)

Or

Credit Card Payment – Please Provide:
Name on Card: _____
Credit Card No: _____
Expiration Date: _____
Amount Charged: $ _____

Signature: _____

Mail to:
AMTA/IEEE Regional Symposium Event Registration
c/o Michelle Taylor
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