

38th Annual Symposium of the Antenna Measurement Techniques Association

AMTA 2016

October 30 - November 4



Final Program



Austin, TX

www.AMTA2016.org

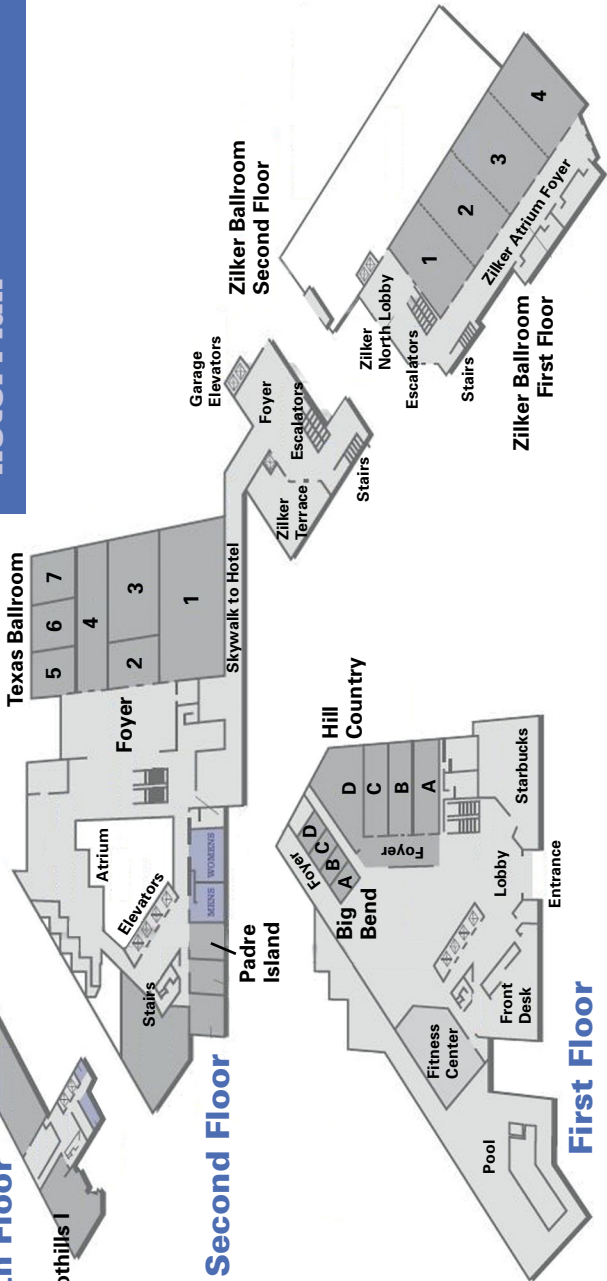
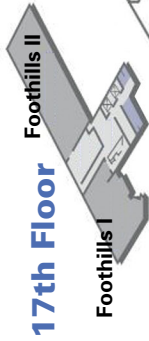
Hosted by



Co-Hosted by



Hotel Plan



First Floor

Welcome



Welcome to Austin!

Thank you for joining us in Austin, Texas for the 38th Annual AMTA Symposium.

Our technical program kicks off on Sunday with the Short Course, "New Frontiers in RF Materials Measurements" presented by Dr. Lydell Frasch, Dr. Michael Havrilla and Dr. Peter Collins. We also have our NEW "Boot Camp" on antenna and related measurement fundamentals. Thank you to Dr. Havrilla for organizing this new course and to the many expert instructors who have volunteered their time to present in the course.

On Monday morning, we have two great keynote speakers, Dr. Brian Kent and Dr. Bob Scully. For Student Day on Tuesday, sponsored by Star Dynamics, Denmar Technical Services, and Integrity Applications, we are fortunate to have speakers Dr. Kent, Mr. Larry Cohen, and Dr. Yizhe Zhang join us. We also have EurAAP speaker Dr. Christian Bornkessel contributing to the technical program on Wednesday and Dr. Gregory Huff who will provide the Thursday Lunch & Learn presentation. We will end the week with our Friday Technical Tour of ETS-Lindgren's world headquarters in nearby Cedar Park, Texas.

You won't want to miss the exhibition that runs Monday through Wednesday to see the many exciting products on display.

Regarding the social events, NEW this year is a 5K Run or Walk on Sunday morning. The Welcome Reception sponsored by NSI-MI Technologies, follows on Sunday evening. The Monday night outing on October 31, sponsored by MVG, features a Halloween theme. Wednesday evening is the Annual Awards Banquet, sponsored by TICRA, NSI-MI Technologies and ETS-Lindgren. Thursday night we have a dinner cruise featuring the largest colony of Mexican free-tailed bats in the US. Our companion tours include visits to charming Fredericksburg and unique venues in downtown Austin.

On behalf of Host ETS-Lindgren and Co-hosts Keysight Technologies, the University of Texas at Austin and Texas A&M University, we thank the many speakers, attendees, exhibitors and sponsors who have contributed to the success of this year's AMTA Symposium.

Janet O'Neil, AMTA 2016 Chair

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AMTA Websites

www.amta.org

www.amta2016.org

Follow all the week's activities on Twitter **#antennaATX**



See what's trending at the show with **#antennaATX**

Share your AMTA experiences **#antennaATX**

Make sure to tweet! We love hearing from you and seeing your AMTA photos!

Meeting Space Wi-Fi



"@Hyatt_Meeting"

If login page does not come up, open your browser (i.e. Safari, Google Chrome), type in the URL of an unsecured site (i.e. cnn.com) - this will trigger the login page. Type in our group code: **AMTA2016**

Future AMTA Symposia

2017	Oct. 15 - 20	Atlanta, GA Hosted by NSI-MI
2018	Nov. 4 - 9	Williamsburg, VA Hosted by Altair Engineering Inc.
2019	Oct. 6 - 11	San Diego, CA Hosted by Microwave Vision Group
2020	TBD	Boston, MA Hosted by CST

Social Programs

NEW! 5K Run or Walk!

Sunday, October 30, 7 - 8:30 a.m.

7 a.m. stretch time; 7:30 a.m. start time

\$25, includes race bib, water bottle, and finisher medal

Ready. Set. Go! An AWESOME way to start the symposium week is to join your AMTA colleagues for a good-morning 5K. Our host hotel is conveniently located on one of the most popular and beautiful river running paths in Austin. During our morning jaunt (run or walk!), you will get a memorable sunrise view of the Texas State Capitol building, catch up with the University of Texas rowing team as they begin their workouts along the banks of the Colorado River and perhaps catch a glimpse of our local migratory celebrities, the Mexican free-tail bats as they return to the Congress Street bridge for their daytime naps. This will be an outing you won't want to miss!

Welcome Reception

Sunday, October 30, 6 - 7:30 p.m.

Sponsored by: NSI-MI

Complimentary to all registered symposium participants and their companions.

Please join us for appetizers, cocktails, and some casual socializing while catching up with old friends and making new acquaintances!



Monday Night Outing

October 31, 6 - 10 p.m.

Sponsored by: Microwave Vision Group

\$85 per person

Join us for a one-of-a-kind Halloween celebration at the Palm Door on Sabine. Located just 15 minutes from the Hyatt Regency Austin, the Palm Door on Sabine features an urban loft environment reserved exclusively for AMTA! With

14' high vaulted ceilings, a long built-in bar, hardwood floors and distinctive indoor and outdoor space, the relaxed environment is a perfect fit for our focus on fun. The menu includes delicious appetizers and a sumptuous dinner buffet of Prime Rib, Tequila Lime Shrimp Shooters, Texas Tapas and Pecan Pie Crumble with Bourbon Sauce for dessert. Two drink tickets will be provided; after that, it's a cash bar. Seating will be reception style so you can mix and mingle all night. Entertainment includes an exciting DJ playing popular tunes and long-time classics. Enjoy dancing indoors or quiet time outdoors visiting with your colleagues under twinkling lights on the deck. Prizes will be awarded for best costumes!

Halloween attire encouraged (optional).

Buses are planned for staggered departures starting at 5:30 p.m.



Student Day

Tuesday, November 1, 11 a.m. - 7 p.m.

Sponsored by Star Dynamics, Denmar Technical Services and Integrity Applications

Complimentary to all student attendees

Student Day provides an opportunity for local college students to get a taste of antenna engineering and related disciplines by interacting with practicing engineers in a variety of venues. Students will be able to tour vendor exhibits, sit in on papers, and enjoy a free lunch and dinner while listening to presentations targeting issues relevant to those about to enter the engineering profession. In addition, AMTA will host a hands-on Student Day Design Contest.

The technical program includes speakers Dr. Brian Kent, Applied Research Associates, Fairborn, Ohio; Dr. Yizhe Zhang, AT&T, Austin, Texas; and Mr. Larry Cohen, Naval Research Lab (NRL), Washington, DC.



Integrity
Applications
Incorporated

Social Programs

Awards Banquet

Wednesday, November 2, 6 - 9:30 p.m.

Included in full registration, Extra Ticket \$75 per person

The Awards Banquet will feature a cocktail reception with light entertainment, a seated dinner, and a presentation of annual awards as well as bingo prizes.

Sponsored by:

NSI-MI, ETS-Lindgren and Ticra



TICRA

Thursday Night Event

November 3, 5:30 - 8 p.m.

Lone Star Riverboat Cruise on Lady Bird Lake

\$50 per person

Enjoy an evening of Bird-Watching, Austin-style! Right in the heart of the Capital City nestled under the Congress Avenue Bridge is the largest colony of Mexican free-tailed bats in the US. At sunset they make their nightly exodus for a dinner of 30,000 pounds of insects. You'll have front row seats for "the show" in an electric-powered Paddle Wheeler that cruises along Lady Bird Lake allowing you to soak in the picturesque city skyline and natural beauty of the city. Includes a casual BBQ dinner served during the cruise plus assorted soft drinks/bottled water, beer and wine. Boarding begins at 5:30 p.m.; boat leaves from Hyatt shoreline at 5:45 p.m. sharp!



Friday Technical Tour

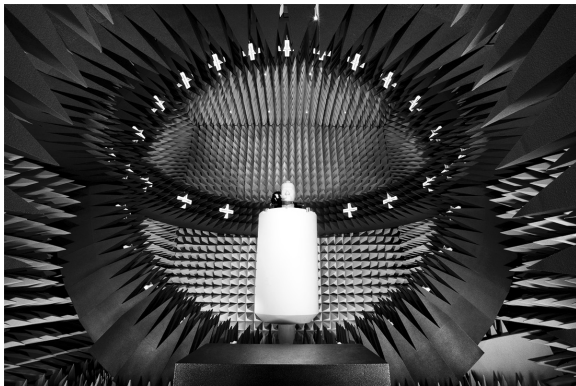
November 4, 9:30 a.m. - 3 p.m.

Meet in the hotel lobby

Includes: Transportation and Lunch, \$45 per person

ETS-Lindgren in Cedar Park is home to one of the nation's premiere acoustic test labs. Bet you weren't expecting that! Here you will see three accredited labs in the areas of Acoustics, Calibration and Wireless testing. ETS-Lindgren's global headquarters also showcases the wireless test solutions that the company has pioneered. In December 2002, ETS-Lindgren became the first CTIA Authorized Test Lab (CATL) for mobile station radiated performance testing. The wireless test systems enable continuous R&D. The tour also includes a 3m semi-anechoic EMC chamber used for testing electronics products, various absorber treatments and lighting solutions, as well as the A2LA accredited calibration lab featuring a 50m x 80m ground plane for antenna calibration to several international standards.

Comfortable walking shoes are recommended.



Companion Tours

Complete Austin Experience

Monday, October 31

10 a.m. - 2 p.m.

\$65, Includes transportation, tour guide, sightseeing tour, craft cocktail, gratuities

Lunch on own

Meet in Hyatt hotel lobby at 9:45 a.m. to board bus

Discover Austin, the "Live Music Capital of the World". Cruise through colorful neighborhoods, including the University of Texas and Sixth Street Districts, while your local guide shares captivating tales of the memorable characters and unique events. History will come alive as you explore the Texas State Cemetery and the illustrious State Capitol complex. Become an artist at Graffiti Park, a very cool local spot. Finish off your day with a personal margarita tutorial and the recipe for Austin's original cocktail.



Fredericksburg and Texas Wine

Tuesday, November 1

10 a.m. - 4:30 p.m.

\$80, Includes transportation, tour guide, sightseeing tour, wine tasting, gratuities. Lunch on own

Meet in Hyatt hotel lobby at 9:45 a.m. to board bus

Discover Texas wines and the historic German town of Fredericksburg. Take in the gorgeous views as you cruise in luxury through the charming Texas Hill Country. Fredericksburg, an idyllic historic town bursting with remnants of its German heritage will lend itself for a stroll at your own pace, enjoying the shops and perhaps some authentic German cuisine. The tour ends with a tasting of Texas wines which are known for their Mediterranean varietals and a photo stop in the Luckenback Texas dancehall.



Sip 'n' Paint: Discover Your Inner Artist

Wednesday, November 2

10 a.m. - 3:30 p.m.

\$70, Includes transportation, guide, paint lesson, all supplies, wine and tacos, gratuities

Meet in Hyatt hotel lobby at 9:45 a.m. to board bus

Anyone can be the next Da Vinci as these talented instructors assist you through a step-by-step painting class. Begin with the Austinite's favorite meal, tacos. Pour yourself a glass of wine as the painting begins. This art studio is designed for the novice, so everyone will easily be able to create a masterpiece! Paintings will be dry by the end of class... and yours to keep! These unique souvenirs will lay flat in a suitcase so they are easy to pack for your flight home.



Foodies' Tastings of Austin

Thursday, November 3

10 a.m. - 2 p.m.

\$70, Includes transportation, guide, tastings, gratuities

Meet in Hyatt hotel lobby at 9:45 a.m. to board bus

Begin your day with a tour of South Austin, including Zilker Park, iconic South Congress Avenue, and its equally charming South 1st Street District. You will make stops at our favorite local eateries, including our amazing food trucks that serve everything from tacos to lobster rolls. As you enjoy your stop-by-stop lunch, your guide will share secrets behind the architecture, people, and happenings that make this neighborhood a favorite for locals and tourists alike. After lunch, enjoy free time on South Congress Avenue with its dozens of shops.



Technical Program

Technical Program Committee

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Randy Jost	Ball Aerospace
Teh-Hong Lee	The Ohio State University
Tracy Johnson	Raytheon Corp.



Short Course

Sunday, October 30

9 a.m. - 5:30 p.m.

New Frontiers in RF Material Measurements

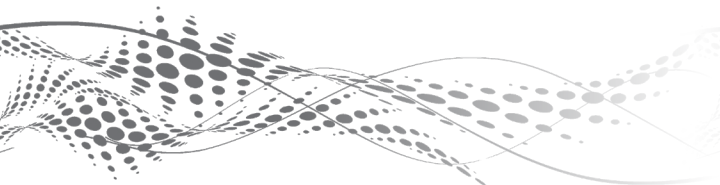
14 Profound advancements in manufacturing and technology have significantly altered the landscape of material and antenna measurements. The primary goal of this short course is to explain, exploit, and demonstrate these recent advances for the benefit of the measurement community. First, a brief review of fundamental material measurement concepts will be provided. Next, new advancements in manufacturing and technology (e.g., additive/subtractive manufacturing) and new-generation (e.g., multiport, multisource, nonlinear) network analyzers are explored. Next, new materials and measurement techniques enabled by the recent advances in manufacturing and technology are provided. A demonstration segment follows in order to encourage a hands-on learning environment. The short course concludes with a discussion of future frontiers and challenges.

Instructors:



Dr. Michael J. Havrilla

is a Professor of Electrical Engineering at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Dr Havrilla received B.S. degrees in Physics and Mathematics in 1987, the M.S.E.E degree in 1989 and the Ph.D. degree in electrical engineering in 2001 from Michigan State University, East Lansing, Michigan.





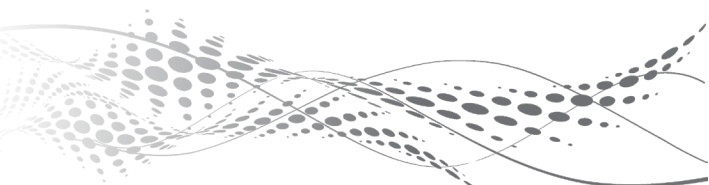
Dr. Lydell L. Frasch

is a Technical Fellow of The Boeing Company, St. Louis, Missouri. Dr. Frasch received the B.S. degree in physics in 1979 and the B.S. in Electrical Engineering in 1980 from the South Dakota School of Mines and Technology, Rapid City, South Dakota. He received the M.S. and Ph.D. degrees in electrical engineering from Michigan State University, East Lansing, Michigan, in 1983 and 1987, respectively.



Dr. Peter J. Collins

is a Professor of Electrical Engineering at the Air Force Institute of Technology, Wright-Patterson AFB, Ohio. Dr. Collins received the B.A. degree from Bethel College, MN and the B.S.E.E. degree from the University of Minnesota, both in 1985, the M.S.E.E. and Ph.D. degrees from the Air Force Institute of Technology, Ohio in 1990 and 1996 respectively.



Boot Camp

Sunday, October 30

9 a.m. - 5:30 p.m.

Organized by Dr. Michael J. Havrilla

The new AMTA "Boot Camp" is a 1-day course on antenna and related measurement fundamentals. Live hands-on demonstrations complement the material presented. The "Boot Camp" is ideal for those new to the antenna and related measurements community and for those who would appreciate an update or refresher course on these topics. Instructors are industry experts who were selected based not only on their expertise, but for their ability to communicate effectively.



Technical Goals and Objectives of the AMTA "Boot Camp" Include:

- Gain Basic Understanding of the AMTA-Relevant Measurement Systems and Associated Equipment
- Obtain Basic Understanding of the Theory and Physical Principles of each Measurement System
- Acquire Technical Vocabulary for each Measurement System
- Gain appreciation for similarities and differences of each Measurement System
- Establish appreciation for the Challenges/Applications that are Driving the Need for each Measurement System
- Identify Common Themes in each Measurement System (Calibration, Standards, Best Practices, Uncertainties).

Course Outline

Introduction to AMTA and General RF Measurements

Brief Overview of the Antenna Measurement Techniques Association (AMTA) by Steve Nichols, NSI-MI Technologies, AMTA President

General RF Measurements by Jim Puri, MVG

Antenna Measurements by Kim Hassett, NSI-MI Technologies

Radar Cross Section (RCS) Measurements
by Brian Kent, Applied Research Associates

Electromagnetic Compatibility/Interference (EMC/EMI) Measurements by Zhong Chen, ETS-Lindgren

Material Measurements by Michael Janezic, National Institute of Standards and Technology (NIST)

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Demonstrations

Presented by Jim Puri, MVG; Ed Szpindor, MVG; and Jeff Kemp, Georgia Tech Research Institute (GTRI)

Includes demonstrations on Antenna Measurements, RCS Measurements, EMC/EMI Measurements, and Material Measurements, using an X-Band Waveguide and Free Space System.

See www.amta2016.org for the complete course outline and speaker biographies.

Special thanks to AMTA 2016 co-host Keysight Technologies for providing much of the demonstration instrumentation used for the Boot Camp and for the Short Course.

Keynote

**Monday,
October 31
8:15 - 9 a.m.**

Dr. Brian Kent

Applied Research Associates,
Fairborn, Ohio

Dr. Robert Scully

NASA, Houston, Texas



Protecting the Space Shuttle from Itself

On 1 February, 2003, the Space Shuttle Columbia disintegrated over Texas and Louisiana as it re-entered Earth's atmosphere, killing all seven crew members. An investigation determined that during the launch a piece of foam insulation broke off from the Space Shuttle external tank and struck the left wing of the orbiter. The resulting damage allowed hot atmospheric gases to penetrate and destroy the internal wing structure, which caused the spacecraft to become unstable and slowly break apart. As a major part of the Return to Flight effort and subsequent operations, NASA developed the capability to use radar to observe the Shuttle stack as it ascended into orbit, the purpose of which was to monitor debris events that occurred during that critical phase of flight. This presentation explains why it was necessary to monitor for debris events, and how it was demonstrated that radar could be used successfully for that purpose.

Dr. Brian M. Kent recently joined Applied Research Associates as a Senior Scientist and S&T Lead for Electromagnetics, Radio Frequency, and Sensing Systems. Previously, he was the Chief Technology Officer, Air Force Research Laboratory, Wright-Patterson Air Force Base, Ohio. Dr. Kent is a Fellow of the IEEE, of the AMTA and of the Air Force Research Laboratory. He co-serves as an Adjunct Professor at Michigan State University. Dr. Kent was a 2009 Meritorious Presidential Rank Awardee.

Dr. Robert Scully holds a Ph.D. from the University of Texas at Arlington in Electrical Engineering with strong emphasis in electromagnetics. He is an IEEE Fellow and immediate Past President of the IEEE EMC Society. Dr. Scully holds a Federal GS15 rating and is the Johnson Space Center Electromagnetic Compatibility (EMC) Group Lead Engineer, serving as the technical lead for EMC at the Center. He supports NASA's major programs including the International Space Station.

Invited Talk from EurAAP

**Wednesday,
November 2
8 - 8:30 a.m.**

Dr. Christian Bornkessel

Technical University of Ilmenau, Germany

Antenna Measurements and Wave Propagation in the Virtual Road for Future Mobility Applications

Dr. Christian Bornkessel received his Dipl.-Ing. degree in 1990 from the Technical University of Ilmenau, Germany and his Dr.-Ing. degree in 1993 from the University of Karlsruhe, Germany. From 1991 to 1995, he was a research assistant at the Institute for High Frequency Techniques and Electronics at Karlsruhe University in the field of numerical analysis of Electromagnetic Compatibility (EMC) aspects. From 1995 to 2014, he was with IMST GmbH, Kamp-Lintfort, Germany, where he was head of the Test Center since 2010. He was responsible for the planning, implementation, accreditation and operation of an accredited EMC test center.

Since 2014, he has been with Technische Universität Ilmenau, RF and Microwave Research Laboratory. He is responsible for a novel nearfield measurement facility called "VISTA" (Virtual Street). His current activities involve radio based car communication (V2X) and EMC aspects with a focus on human exposure to RF and LF electromagnetic fields.



Lunch and Learn

Thursday, November 3

11:30 a.m. - 1:30 p.m.

Professor Gregory H. Huff

Associate Professor of Electrical and
Computer Engineering,
Texas A&M University

Collaborative Beamforming from Swarming UAS

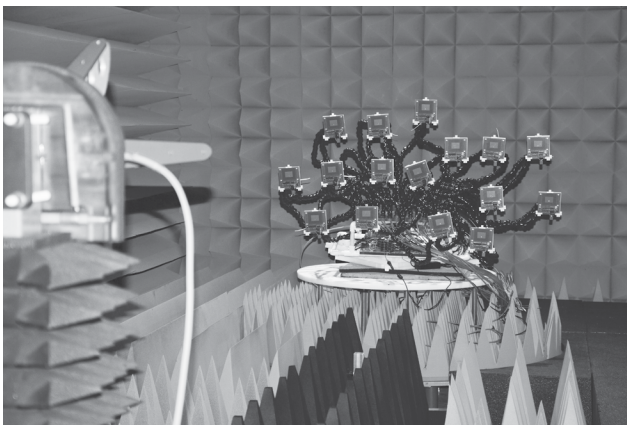
Unmanned aircraft systems (UAS), otherwise known as drones or UAVs, have become indispensable tools in security, entertainment, and research but we are just beginning to understand their collective capabilities in unstructured swarms and clusters. This talk will examine some of the pioneering research into the development of experimental test-beds, analysis tools, and reconfigurable antenna technologies developed to study the behavior of these unique systems-of-systems.

Gregory H. Huff has a range of experience in applied electromagnetics and multidisciplinary systems engineering, and he has received numerous accolades for his work in this area. This includes reconfigurable RF and microwave antennas as well as other adaptive electromagnetic devices to support UAS control and communication in networked clusters of UAS. This talk will focus on the development of MEDUSA, which is a computer vision-assisted phased array controller that was engineered to study the behavior of unstructured volumetric arrays in morphing clusters.



Professor Huff received his B.S., M.S., and Ph.D. degrees in Electrical Engineering from the University of Illinois at Urbana-Champaign, in 2000, 2003, and 2006, respectively. He has been with the Electromagnetics and Microwave Laboratory in the Department of Electrical and Computer Engineering at Texas A&M University in College Station, Texas since 2006 and is currently at the rank of Associate Professor. Prof. Huff is currently on the steering committee for the Center for Autonomous Vehicles and Sensor

Systems (CANVASS) at Texas A&M University, where his current research in UAS blends concepts from material science engineering, aerospace engineering, and other focus areas. He is also active in the development of other enabling technologies including the use of smartphones and tablets in embedded systems for adaptive wireless sensor networks, and mobile applications ('apps') which examine the role of interactive interfaces for UAS control algorithms and sensor data fusion. Prior to his academic activities, Prof. Huff apprenticed professionally and attained the rank of Chef de Cuisine with specializations in French and Mediterranean fare.



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Share your AMTA experiences
#antennaATX

Make sure to tweet! We love
hearing from you and seeing
your AMTA photos!



Sessions

MONDAY

8 - 9:06 a.m.

Meeting Opening/Keynote Address

Welcome and Introduction of Keynote Speakers:

Steve Nichols (AMTA President)

Keynote Address:

Protecting the Space Shuttle from Itself

Dr. Brian Kent, Applied Research Associates, Fairborn, Ohio
and Dr. Robert Scully, NASA, Houston, Texas

Opening Remarks and Instructions:

Dirk Heberling

22 **Session 1**

9:06 - 10 a.m.

General Antenna Measurement 1

Chair: Jeffrey Bean (Georgia Tech Research Institute)

A16-0020: "Phase Error Characterization of a Space-Fed Array,"
Brian Holman, Jacob Houck, Philip Brady (Georgia Tech Research
Institute)

A16-0049: "Efficient Diagnosis of Radiotelescopes Misalign-
ments," Amedeo Capozzoli¹, Angelo Liseno¹, Claudio Curcio¹,
Salvatore Savarese¹, Pietro Schipani² (¹Dipartimento di Ingegneria
Elettrica e Tecnologie dell'Informazione (DIETI), ²INAF - Istituto
Nazionale di Astrofisica)

A16-0118: "Precise Determination of Phase Centers and Its
Application to Gain Measurement of Spacecraft-borne Antennas
in an Anechoic Chamber," Yuzo Tamaki^{1,2}, Takehiko Kobayashi¹,
Atsushi Tomiki² (¹Tokyo Denki University, ²Japan Aerospace
Exploration Agency)

10 - 10:30 a.m.

Morning Break

Session 2

10:30 - 11:42 a.m.

Extreme AMTA: Unique Challenges and Unique Solutions

Chair: Luca Salghetti Drioli (European Space Agency)

A16-0076: "Minimum Scattering Probe for High Accuracy Planar NF Measurements," Andrea Giacomini, Lars Foged, Roberto Morbidini, Luca Tancioni, John Estrada, Jim Acree (Microwave Vision Group)

A16-0021: "An Overview of Atom-Based SI-traceable Electric-Field Metrology," Joshua Gordon, Christopher Holloway, Matthew Simons (National Institute of Standards and Technology (NIST))

A16-0042: "Meteosat Third Generation (MTG) DCS and GEO-SAR Antenna Testing at ESA/ESTEC," Luis Rolo¹, Luca Salghetti Drioli¹, Damiano Trenta¹, Eric van der Houwen¹, Paolo Noschese², Enrico D'Agostino², Roberto Flamini², Marcello Zolesi² (¹ESA-ESTEC, ²Thales Alenia Space - Italy)

A16-0115: "Characterization of Dual-Band Circularly Polarized Active Electronically Scanned Arrays (AESA) Using Electro-Optic Field Probes," Kazem Sabet, Richard Darragh, Ali Sabet, Sean Hatch (EMAG Technologies Inc.)

11:42 a.m. - 1:30 p.m.

Exhibitors' Lunch - Exhibit Areas

Session 3

1:30 - 3 p.m.

Compact Range Measurement

Chair: Ed Urbanik (BerrieHill Research Corporation)

A16-0018: "Investigation into Antenna Measurement Quality from a Large Compact Range Operating at Q-Band," James Stewart¹, Brittany Wells¹, George Kakas¹, John Borger¹, Sarah Terry², Jarod Petry³ (¹Air Force Research Laboratory, ²Riverside Research Institute, ³Defense Engineering Corporation)

A16-0068: "Transfer Function Characterization for a Dual Reflector, Indoor Compact Range," Thomas Cowles, Lonny Walker (Raytheon Space and Airborne Systems)

Sessions

A16-0074: "Correcting Polarization Distortion in a Compact Range Feed," Brett Walkenhorst, David Tammen (NSI-MI Technologies)

A16-0086: "Inverse Scattering and Imaging of Compensated Compact Ranges by Plane Wave Analysis," Engin Gülten¹, Josef Migl¹, Thomas Eibert² (¹Airbus DS GmbH, ²Technical University of Munich)

A16-0098: "A Very Large Measurement System of Compact Range," Zhi Ping Li¹, Jian Hua Wu¹, Zheng Peng Wang¹, Hai Bo Chen², Guo Yu He² (¹BeiHang University, ²Guoyu Microwave Technology Co., Ltd)

3 - 3:30 p.m. **Afternoon Break**

Session 4

3:30 - 5 p.m. **RCS Measurement**

Chair: Christer Larsson (Saab Dynamics and Lund University)

A16-0045: "BIANCHIA: A Spherical Indoor Facility for Bistatic Electromagnetic Tests," Patricia López-Rodríguez, Olga Hernández-Vega, David Poyatos-Martínez, David Escot-Bocanegra (Spanish National Institute for Aerospace Technology (INTA))

A16-0046: "Efficient Full-Wave Algorithms for Monostatic RCS of Electrically Large Structures," Oscar Borries, Erik Jørgensen, Peter Meincke (TICRA)

A16-0089: "Near to Far Field Transformation of RCS Using a Compressive Sensing Method," Christer Larsson (Lund University and Saab Dynamics)

A16-0120: "Utilization of an Octocopter as a Two-Way Field Probe for Electro-Magnetic Field Measurements at an Outdoor Radar Cross Section Range," Andrew J. Knisely, Peter J. Collins (Air Force Institute of Technology)

A16-0121: "A New Bi-static RCS measurement Technique for Compact Antenna Test Ranges," Rakesh Kumar Singh^{1,2}, N.V.S.N. Sarma², DR Jahagirdar¹ (¹Research Centre Imarat, Defence Research & Development Organisation, Hyderabad, ²National Institute of Technology, Warangal)

TUESDAY

Session 5

8 - 9:30 a.m.

Novel Antenna Design

Chair: Lars Foged (Microwave Vision Group)

A16-0032: "Comparative Analysis of Dual Band Elevated Antenna on a Silicon Base," SSS Kalyan, Sarat K. Kotamraju, K. Ch. Sri Kavya (KL University)

A16-0088: "A Novel Customized Spline-Profiled mm-Wave Horn Antenna for Emerging High Performance CubeSats," Vignesh Manohar, Joshua Kovitz, Yahya Rahmat-Samii (University of California, Los Angeles)

A16-0063: "A Reconfigurable Antenna Construction Toolkit with Modular Slotted Waveguide Elements for Arbitrary Pattern Designs," R. Geise¹, G. Zimmer¹, B. Neubauer¹, E. Gülten², A. Geise² (¹University of Braunschweig, ²Airbus DS GmbH)

A16-0128: "Measurement Uncertainties in Millimeter Wave "On-Chip" Antenna Measurements," Edward Szpindor, Wenji Zhang, Per Iversen (MVG-Orbit/FR)

A16-0097: "60 GHz Reference Chip Antenna for Gain Verification of Test Chambers," William McKinzie¹, Per Iverson², Edward Szpindor², Michael Smith³, Bradley Thrasher³ (¹WEMTEC, Inc., ²Orbit/FR, ³DuPont Microcircuit Materials)

9:30 - 10 a.m.

Morning Break

Session 6

10 - 11:30 a.m.

Range Design and Quiet Zone

Chair: Chi-Chih Chen (The Ohio State University)

A16-0094: "Improving Test Efficiency on a Limited Budget – A Measurement Timing Case Study," Steven Nichols, Rick Burge, Steve Stafford (NSI-MI Technologies)

A16-0034: "Improved Clutter Removal for Measuring Wall

Sessions

Reflectivity Using the RCS Technique," Marc Dirix¹, Amin Enayati², Joachim van Wesemael², Pawel Bajurko³ (¹Marc Dirix / RF, ²Emerson & Cuming Anechoic Chambers, ³Warsaw University of Technology)

A16-0061: "Limitations of the Free Space VSWR Measurements for Chamber Validations," Zhong Chen¹, Zubiao Xiong², Amin Enayati³ (¹ETS-Lindgren, Inc., ²University of Houston, ³Emerson & Cuming Anechoic Chambers)

A16-0075: "Enabling Extremely High Dynamic Range Measurements using a Simple Correlator," Brett Walkenhorst (NSI-MI Technologies)

A16-0090: "A Polynomial Approximation for the Prediction of Reflected Energy from Pyramidal RF Absorbers," Vince Rodriguez, Edwin Barry (NSI-MI Technologies)

11 a.m. - 7 p.m.

26 **Student Day**

11:30 a.m. - 1:30 p.m.

Business Lunch

Session 7

1:30 - 3 p.m.

Spherical Near-Field Measurement

Chair: Sergiy Pivnenko (Antenna Systems Solutions)

A16-0024: "Spherical Field Transformation for Hemispherical Antenna Measurements above Perfectly Conducting Ground Planes," Raimund Mauermayer, Thomas Eibert (Technical University of Munich)

A16-0041: "Nonredundant NF-FF Transformation with Spherical Scan Accounting for an Offset Mounting of a Long AUT," Francesco D'Agostino, Flaminio Ferrara, Claudio Gennarelli, Rocco Guerriero, Massimo Migliozi (University of Salerno)

A16-0043: "Insights Into Spherical Near Field Probe Correction Gained From Examining the Probe Response Constants," Jason Jerauld (Raytheon Company)

A16-0070: "Echo Reduction with Minimum Sampling in Spherical Near Field Measurements using Translated-SWE Algorithm,"

Francesco Saccardi¹, Lars Foged¹, Francesca Mioc¹,
Per Iversen² (¹Microwave Vision Italy, ²Orbit/FR)

A16-0085: "Spherical Near-Field Alignment Sensitivity for Polar and Equatorial Antenna Measurements," Patrick Pelland, Greg Hindman, Daniël Janse van Rensburg (NSI-MI Technologies)

3 - 3:30 p.m.

Afternoon Break

Session 8

3:30 - 5 p.m.

Poster Session I

Chair: Brian Fischer, Co-Chairs: Teh-Hong Lee, Ivan LaHaie (Integrity Applications Inc., The Ohio State University, Integrity Applications Inc.)

A16-0013: "Determination of the Far Field Radiation Pattern of an Antenna from a Set of Sparse Near Field Measurements," Scott Kordella¹, Kenneth Grimm² (¹MITRE, ²Consultant Gainesville, Virginia, USA)

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A16-0022: "Dual Band Dually Polarized Minkowski Fractal Boundary Patch Antenna Based on Epsilon-Negative Transmission Line," Suman Nelaturi, N.V.S.N. Sarma (National Institute of Technology, Warangal)

A16-0028: "Far Field Uncertainty Due to Noise and Receiver Nonlinearity in Planar-Near Field Measurements," Serge Balma^{1,2}, Dominique Picard¹, Pascal Meisse² (¹Université Paris-Sud, Université Pierre et Marie Curie, ²Intespace)

A16-0040: "Nonredundant NF-FF Transformation with Bi-Polar Scanning: Experimental Testing," Francesco D'Agostino, Flaminio Ferrara, Claudio Gennarelli, Rocco Guerriero, Massimo Migliozi (University of Salerno)

A16-0054: "A 6-40 GHz Antenna System for CubeSat Radiometer," Jiu-Kun Che, Chi-Chih Chen (The Ohio State University)

A16-0084: "Millimeter-wave Antenna Measurements Using a Novel Approach," Tom Newman, Joe Chandler (Millitech, Inc.)

A16-0108: "Dependence of Antenna Cross-polarization Performance on Waveguide-to-Coaxial Adapter Design," Vince Rodriguez, Edwin Barry, Steven Nichols (NSI-MI Technologies)

Sessions

A16-0016: "Practical Considerations for Coordinate System Rotations in Mode-Space," Ryan Cutshall, Jason Jerauld, Justin Dobbins (Raytheon Company)

A16-0051: "Measurements and Numerical Simulations to Enhance the Assessment of Antenna Coupling," Lars Foged, Lucia Scialacqua, Andrea Giacomini, Francesco Saccardi, Francesca Mioc (Microwave Vision Italy)

A16-0071: "Probe Correction Technique of Arbitrary Order for High Accuracy Spherical Near Field Antenna Measurements," Francesco Saccardi, Andrea Giacomini, Lars Foged (Microwave Vision Italy)

5:15 - 6:15 p.m.

IEEE 149 Working Group Meeting

28 **WEDNESDAY**

Session 9

8 - 9:30 a.m.

Measurements for Automotive Applications

Chair: Zhong Chen (ETS-Lindgren, Inc.)

Invited Talk from EurAAP: "Antenna Measurements and Wave Propagation in the Virtual Road for Future Mobility Applications," Christian Bornkessel, Technical University of Ilmenau, Germany

A16-0027: "A Radar Echo Emulator for the Evaluation of Automotive Radar Sensors," Domenic Belgiovane, Chi-Chih Chen, J. Landon Garry (The Ohio State University)

A16-0119: "Automotive Antenna Evaluation," Garth D'Abreu (ETS-Lindgren, Inc.)

A16-0023: "The Measurement of Horizontal Magnetic Dipole Moment at a Conducting Ground Plane Using a Modified Van Veen Loop," James McLean, Robert Sutton (TDK R&D Corp.)

9:30 - 10 a.m.

Morning Break

Session 10

10 - 11:30 a.m.

Measurements for Wireless Applications

Chair: Christian Bornkessel (Technical University of Ilmenau)

A16-0106: "Advances in MIMO Over-the-Air Testing Techniques for Massive MIMO and other 5G Requirements," Michael Foegelle (ETS-Lindgren, Inc.)

A16-0107: "Advances in Over-the-Air Performance Testing Methods for mmWave Devices and 5G Communications," Michael Foegelle (ETS-Lindgren, Inc.)

A16-0117: "Instantaneous TRP Measurements," James Huff (The Howland Company, Inc.)

A16-0125: "Detailed Uncertainty Analysis of the Electrically Small Antenna Efficiency Measurement," Abdul Sattar Kaddour¹, Essia Benabdallah¹, Serge Bories¹, Christophe Delaveaud¹, Anthony Bellion² (¹CEA LETI, ²CNES)

A16-0078: "A Dual U Slot Conformal Antenna for Wi-Fi Application," Ratikanta Sahoo, D. Vakula, N.V.S.N. Sarma (National Institute of Technology, Warangal)

11:30 a.m. - 1:30 p.m.

Lunch

12 - 1:15 p.m.

IEEE 1128 Working Group Meeting

Session 11

1:30 - 3 p.m.

General Antenna Measurement 2

Chair: Peter Collins (Air Force Institute of Technology)

A16-0109: "A Tetherless, Absolute-Time Channel Sounder; Processing and Results for a Complex Environment," David Novotny, Alexandra Curtin, Jeanne Quimby, Kate Remley, Peter

Sessions

Papazian, Richard Candell (National Institute of Standards and Technology (NIST))

A16-0026: "Gain Comparison of 3D Printed Horns and an Electroformed Horn of the Same Size and Shape," Michael Francis, David Novotny, Joshua Gordon, Alexandra Curtin, Ronald Wittmann (National Institute of Standards and Technology (NIST))

A16-0035: "A Rotating Source Polarization Measurement Technique Using Two Circularly Polarized Antennas," Herbert Aumann¹, Kristan Tuttle² (¹University of Maine, ²MIT Lincoln Laboratory)

A16-0123: "In-situ Diagnosis of Direction Finding Antenna using Optically-fed Transmitting Miniature Probes," Serge Bories, Lama Ghattas, Dominique Picard (CEA LETI)

A16-0048: "Gain Antenna Measurement Using Single Cut Near Field Measurements," Manuel Sierra Castañer¹, Francesco Saccardi², Lars Foged² (¹Universidad Politécnica de Madrid (UPM), ²Microwave Vision Italy)

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3 - 3:30 p.m.

Afternoon Break

Session 12

3:30 - 5 p.m.

Poster Session II

Chair: Justin Dobbins, Co-Chairs: Francesco D'Agostino, David A. Tonn, Raimund Mauermayer (Raytheon Company, University of Salerno, Naval Undersea Warfare Center, Technical University of Munich)

A16-0110: "Multiple Target, Dynamic RF Scene Generator," David Wayne, John McKenna, Scott McBride (NSI-MI Technologies)

A16-0031: "Effective Numerical Methods for Installed Performance of Antenna Arrays on Electrically-Large Platforms," Derek Campbell, C.J. Reddy (Altair Engineering, Inc.)

A16-0047: "Dual-polarized Monolithic Leaky Wave Antenna Enabled by Additive Manufacturing," Esteban Menargues¹, Maria Garcia-Vigueras², Emile de Rijk³, Juan R. Mosig¹ (¹LEMA-EPFL, ²Institut d'Electronique et de Télécommunications de Rennes (IETR), ³SWISSto12)

A16-0080: "Indoor 3D Spherical Near Field RCS Measurement Facility: 3D RADAR Images from Simulated and Measured Data," Pierre Massaloux, Pierre Minvielle (CEA/CESTA)

A16-0087: "Quiet-Zone Qualification of a Very Large, Wideband Rolled-Edge Reflector," Anil Tellakula, William Griffin, Scott McBride (NSI-MI Technologies)

A16-0099: "Roughness Impact on the RCS of Simple Canonical Objects in the Terahertz Regime," Wei Gao¹, Xiao-Lin Mi¹, Yi Liao¹, Xiao-Bing Wang² (¹Shanghai Key Laboratory of Electromagnetic Environmental Effects for Aerospace Vehicle, ²Science and Technology on Electromagnetic Scattering Laboratory)

A16-0116: "Extrapolation Range for D-band Standard Gain Horn Antenna Measurement," Jin-Seob Kang, Jeong-Hwan Kim (Korea Research Institute of Standards and Science (KRISS))

A16-0127: "An Innovative Wide-Band Indoor Far-Field Extrapolation Range," William Dykeman¹, Trae Blain¹, Dale Canterbury¹, Christopher Fisher¹, Christopher Peters¹, David Fooshe², Bert Schluper², Eddy Park² (¹Raytheon Company, ²NSI-MI Technologies)

A16-0077: "Gain Enhancement of Monopole Antenna using Broadband Artificial Material for UWB Application," Rahul Singha, D. Vakula, N.V.S.N. Sarma (National Institute of Technology, Warangal)

A16-0053: "Characterizing Multiple Coherent Signals Near 60 GHz Using Standard RF Hardware for MIMO and 5G Applications," Alexandra Curtin, David Novotny, Joshua Gordon (National Institute of Standards and Technology (NIST))

6 - 9:30 p.m.

Awards Banquet

THURSDAY

Session 13

8 - 9:30 a.m.

RF Material Measurement

Chair: Lydell Frasch (The Boeing Company)

A16-0030: "Implementation and Testing of Engineered Anisotropic Dielectric Materials," David Tonn¹, Susan Safford¹, Michael

Sessions

Lanagan², Eugene Furman², Stephen Perini² (¹Naval Undersea Warfare Center, Division Newport, ²The Pennsylvania State University)

A16-0039: "Correction of Transmission Line Induced Phase and Amplitude Errors in Reflection and Transmission Measurements," John Schultz, James Maloney (Compass Technology Group)

A16-0065: "Uniaxial Anisotropic Material Measurement using a Single Port Waveguide Probe," Alexander Knisely, Milo Hyde, Michael Havrilla, Peter Collins (Air Force Institute of Technology (AFIT))

A16-0103: "Changes in the DO-213 Standard for Commercial Nose-Radome Testing," Scott McBride, Steven Nichols, Mike Murphy, Vince Rodriguez, George Cawthon (NSI-MI Technologies)

A16-0095: "A Study of the Low-frequency Coaxial Reflectometer Measurement Procedure for Evaluation of RF Absorbers' Reflectivity," Anoop Adhyapak, Zhong Chen (ETS-Lindgren, Inc.)

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9:30 - 10 a.m.

Morning Break

Session 14

10 - 11:30 a.m.

Innovative Approaches of Antenna

Measurement

Chair: David Novotny (National Institute of Standards and Technology)

A16-0036: "Towards Planar Phaseless Nearfield Measurements of ESA's JUICE Mission 600 GHz SWI Reflector Antenna," Javier Fernández Álvarez, Olav Breinbjerg (Technical University of Denmark (DTU))

A16-0052: "Optimizing a CATR Quiet Zone using an Array Feed," Clive Parini¹, Rostyslav Dubrovka¹, Stuart Gregson² (¹Queen Mary University of London, ²NSI-MI Technologies)

A16-0060: "The Effect of the Receiving-Antenna Pattern on the Results of the Free-Space VSWR Technique," Amin Enayati¹, Zhong Chen² (¹Emerson & Cuming Anechoic Chambers, ²ETS-Lindgren, Inc.)

A16-0072: "Improving the Cross-Polar Discrimination of Compact Antenna Test Range using the CXR Feed," Andrea Giacomini¹, Lars Foged¹, Antonio Riccardi¹, Jörg Pamp², Rasmus Cornelius², Dirk Heberling² (¹Microwave Vision Group, ²RWTH Aachen University)

A16-0102: "Implementation of a Combination Planar and Spherical Near-Field Antenna Measurement System using an Industrial 6-Axis Robot," John Hatzis, Patrick Pelland, Greg Hindman (NSI-MI Technologies)

11:30 a.m. - 1:30 p.m.

Lunch & Learn:

Collaborative Beamforming from Swarming UAS

Gregory H. Huff, Texas A&M University

Session 15

1:30 - 3 p.m.

General Near-Field Measurement

Chair: Stuart Gregson (NSI-MI Technologies)

A16-0050: "Compact First-Order Probe for Spherical Near-Field Antenna Measurements at P-band," Oleksiy Kim (Technical University of Denmark (DTU))

A16-0083: "Phaseless Near-Field Antenna Measurement Techniques – An Overview," Olav Breinbjerg, Javier Fernández Álvarez (Technical University of Denmark (DTU))

A16-0111: "Experimental Validation of Simplified Probe Pattern Correction in Spherical Near-Field Antenna Measurements," Sergiy Pivnenko¹, Enrique Venero¹, Carlo Rizzo¹, Belen Galocha² (¹Antenna Systems Solutions S.L. (ASYSOL), ²Universidad Politécnica de Madrid (UPM))

A16-0114: "Phase-less Spherical Near-Field Antenna Characterization: A Case Study and Comparison," Hammam Shakhtour, Dirk Heberling (RWTH Aachen University)

A16-0081: "Implementation of a VHF Spherical Near-Field Measurement Facility at CNES," Gwenn Le Fur¹, Guillaume Robin¹, Nicolas Adnet¹, Luc Duchesne¹, Daniel Belot², Lise Feat², Kevin Elis², Anthony Bellion², Romain Contreres² (¹MVG Industries, ²CNES)

Sessions

3 - 3:30 p.m.

Afternoon Break

Session 16

3:30 - 5 p.m.

Numerical Methods and Data Processing

Chair: C.J. Reddy (Applied EM)

A16-0029: "Radar Echoes from Metal Spheres Large and Small,"
Pax Wei (Boeing Company (retired))

A16-0025: "Time Gating Based on Sparse Time Domain Signal
Reconstruction from Limited Frequency Domain Information,"
Raimund Mauermayer, Thomas Eibert (Technical University of
Munich)

34 A16-0058: "Study of PO Analytic Methods for Serrated CATR
Quiet Zone Simulation," Fernando Rodríguez Varela, José Luis
Besada Sanmartín, Belén Galocha Iragüen (Universidad Politéc-
nica de Madrid (UPM))

A16-0073: "Source Reconstruction by Far-Field Data for Imag-
ing of Defects in Frequency Selective Radomes," Bjorn Widen-
berg¹, Kristin Persson², Mats Gustafsson², Gerhard Kristensson²
(¹Radomes & Antennas, GKN Aerospace Applied Composites AB,
²Lund University)

Concluding Remarks

AMTA Technical Coordinator Dirk Heberling

Meeting Adjournment

AMTA President Steve Nichols

5:30 - 8 p.m.

Lone Star Riverboat Cruise

Important Reminder to Authors

New this year, AMTA authors have the option of having their papers published on the IEEE **Xplore** digital library, in addition to being included in the AMTA 2016 proceedings.

To also be included on **Xplore**, there are a few specific paper requirements that must be met.

These are shown on

www.amta2016.org/documents/Xplore.pdf

NOTE: The extended deadline to include your paper on IEEE Xplore is **November 11, 2016** – NO EXCEPTIONS!

Questions?

Contact the AMTA Technical Coordinator

Dirk Heberling at

technical-coordinator@amta.org

Exhibitor Profiles

Altair Engineering

FEKO, part of the Altair HyperWorks® suite, is a state of the art computational electromagnetic simulation software tool that enables users to solve a wide range of electromagnetic problems. Typical applications include analyses of horns, radiation patterns and hazard zones, wire, reflector, conformal, and broadband antennas, microstrip patches, arrays, antenna placement and design. Analyses related to EMC (including shielding & cable coupling), RCS (scattering problems), waveguide structures (RF components), SAR extraction (Bio-electromagnetics), and multiple dielectric layers (Radomes) are also covered.

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Booth 207



Altair

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Booth L02



Exhibitor Profiles

AMTA 2017 Symposium

38 NSI-MI Technologies is proud to host the 39th Annual Meeting and Symposium of the Antenna Measurement Techniques Association from October 15-20, 2017. Please join us at the Grand Hyatt Buckhead in Atlanta, Georgia, USA to experience the charm that this southern capital city is well known for. This iconic hotel is located in the heart of Atlanta's most fashionable shopping, dining and vibrant entertainment district. It is also just minutes away from Atlanta's most popular destinations, including Midtown, High Museum of Art, SkyView, the CNN Center, Georgia Aquarium, World of Coca-Cola, and College Football Hall of Fame. So keep Georgia on your mind and mark your calendars down to attend an event you won't want to miss!

Visit us at Booth L08 for more information.



Anechoic Systems

Anechoic Systems LLC provides complete state-of-the-art Anechoic Chambers from the design, build, install all materials to testing. We specialize in all types of Anechoic Chamber installations including, but not limited to, shielding, all varieties of absorber materials, R Cards and more.

Tabletop L09



Exhibitor Profiles

Anritsu

Anritsu is a global leader in innovative communications test and measurement solutions for more than 110 years. We provide solutions for wired and wireless communication systems and operators.

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Booth 115



ANSYS

If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge, or put on wearable technology, chances are you've used a product where ANSYS software played a critical role in its creation. ANSYS is the global leader in engineering simulation. We help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and engineer products limited only by imagination. www.ansys.com

Booth L05

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Sun

October 30

Mon

October 31

Tue

November 1

Registration

6:30 - 10 a.m.;
2 - 5 p.m.
Zilker atrium foyer

5K Run/Walk

7 - 8:30 a.m.
Hotel Lobby

SC & BC Breakfast

8 - 9 a.m.
Hill Country Foyer
1st floor, Lobby Level

Short Course

9 a.m. - 5:30 p.m.
Hill Country Ball-
room A/B 1st floor,
Lobby Level

Boot Camp

9 a.m. - 5:30 p.m.
Hill Country Ball-
room C/D 1st floor,
Lobby Level

Short Course & Boot Camp Lunch

Big Bend A/B
1st floor, Lobby Level

**Keynote and
Sessions 1-12 are in
Zilker Ballroom 4
on Ground Floor
(access via walkway
from 2nd floor of
hotel or exit hotel
lobby and go left)**

Welcome Reception

6 - 7:30 p.m.
Foothills Ballroom
17th floor

Registration

7 - 11:30 a.m.;
2 - 4 p.m.
Zilker atrium foyer

Breakfast

7 - 8 a.m.
Texas 1, 2nd floor

Exhibits Open

10 a.m. - 5 p.m.
Zilker Ballroom 1/2/3
Padre Island 2nd floor

The Complete Austin Experience T

10 a.m. - 2 p.m.

Companion Suite

8:30 - 10 a.m.
Big Bend A/B Lobby Level

Opening/Keynote

8 - 9:06 a.m.
Zilker Ballroom 4

Session 1

9:06 - 10 a.m.

Morning Break

10 - 10:30 a.m.

Session 2

10:30 - 11:42 a.m.

Exhibitor's Lunch

11:42 a.m. - 1:30 p.m.
Exhibit Areas

Session 3

1:30 - 3 p.m.

Afternoon Break

3 - 3:30 p.m.

Session 4

3:30 - 5 p.m.

Mon. Night Outing Palm Door Halloween Party on Sabine

6-10 p.m.
Buses load hotel front drive

Registration

7 - 11:30 a.m.;
2 - 4 p.m.
Zilker atrium foyer

Breakfast

7 - 8 a.m.
Texas 1, 2nd floor

Exhibits Open

9 - 11:30 a.m.; 1:30 - 5 p.m.
Zilker Ballroom 1/2/3
Padre Island 2nd floor

Fredericksburg & Texas Wine T

10 a.m. - 4:30 p.m.

Companion Suite

8:30 - 10 a.m.
Big Bend A/B Lobby Level

Student Day

11 a.m. - 7 p.m.
Hill Country Ballroom

Session 5

8 - 9:30 a.m.
Zilker Ballroom 4

Morning Break

9:30 - 10 a.m.

Session 6

10 - 11:30 a.m.

Business Lunch

11:30 a.m. - 1:30 p.m.
Texas 1/2/3 2nd floor

Session 7

1:30 - 3 p.m.

Afternoon Break

3 - 3:30 p.m.

Session 8/Poster I

3:30 - 5 p.m.

**IEEE Standard 149
Antenna Wrkng Grp Mtg.**
5:15 - 6:15 p.m. Big Bend
C/D 1st floor Lobby Level

Exhibitor Reception

5:15 - 6:15 p.m.
Foothills Ballroom II
17th floor

Wed

November 2

Registration

7:30 - 11:30 a.m.
2 - 4 p.m.
Zilker atrium foyer

Breakfast

7 - 8 a.m.
Texas 1, 2nd floor

Exhibits Open

9 a.m. - 4 p.m.
Zilker Ballroom 1/2/3
Padre Island 2nd floor

Sip 'n' Paint: Discover Your Inner Artist

10 a.m. - 3:30 p.m.



Companion Suite

8:30 - 10 a.m.
Big Bend A/B Lobby Level

Session 9

8 - 9:30 a.m.
Zilker Ballroom 4

Morning Break

9:30 - 10 a.m.

Session 10

10 - 11:30 a.m.

Lunch

11:30 a.m. - 1:30 p.m.
Zilker Terrace, 2nd floor

**IEEE Standard 1128
Absorber Wrkng Grp Mtg.**
12 - 1:15 p.m. Big Bend C/D
1st floor Lobby Level

Session 11

1:30 - 3 p.m.

Afternoon Break

3 - 3:30 p.m.

Session 12/Poster II

3:30 - 5 p.m.

Pre Banquet Reception

6 - 7 p.m.
Texas Foyer, 2nd floor

Awards Banquet

7 - 9:30 p.m.
Texas 1/2/3 2nd floor

Thu

November 3

Registration

7:30 a.m. - Noon
Zilker atrium foyer

Breakfast

7 - 8 a.m.
Texas 1, 2nd floor

Exhibits Tear Down

8 a.m. - 3 p.m.

Foodies' Tastings of Austin

10 a.m. - 2 p.m.



Companion Suite

8:30 - 10 a.m.
Big Bend A/B Lobby Level

Session 13

8 - 9:30 a.m.
Texas 1/2/3 2nd floor

Morning Break

9:30 - 10 a.m.

Session 14

10 - 11:30 a.m.

Lunch & Learn

11:30 a.m. - 1:30 p.m.
Texas 1/2/3 2nd floor

Session 15

1:30 - 3 p.m.

Afternoon Break

3 - 3:30 p.m.

Session 16 & Door Prizes

3:30 - 5 p.m.

Lone Star Riverboat Cruise

5:30 - 8 p.m.
Board at Hyatt Dock,
boat leaves at 5:45 p.m.
sharp

Fri

November 4



**Technical Tour
ETS-Lindgren**
9:30 a.m. - 3 p.m.
Bus loads from
Hotel front drive
at 9:30 a.m.



**Companion
Tours:**
Bus loads from
hotel front drive
at 9:45 a.m.
Mon.-Thurs.

Sessions 13 -16 are
in Texas 1/2/3
2nd floor

Exhibitor Profiles

AP Americas

The Texas-based AP Americas and the Belgium-based Emerson & Cuming offer state-of-the-art microwave chambers for near- and far-field antenna measurements, compact range chambers, anechoic chambers for RCS testing, wireless applications and general RF measurements.

Recently, Emerson & Cuming launched advanced WAVASORB absorbers, showing outstanding performance even above 100 GHz. The absorbers also conform to ROAHS and REACH and have outstanding extended performance stability.

The chamber manufacturer AP Americas is the distributor of Emerson & Cuming and has its own production for shielding. AP Americas has years of experience in project management and installation.

AP Americas Inc., www.apamericas.com

Booth 407

 **AP Americas**

ARC Technologies

ARC Technologies Inc. offers a complete range of absorber products that provide solutions to the diverse RF and EMI problems facing today's military, aerospace, and commercial electronics design engineers. Whether a customer is facing these problems at 10 MHz or 110 GHz, nearfield or farfield, narrowband or broadband, we have an absorber product or will develop an application-specific product to meet its requirements. To learn more visit www.arc-tech.com.

Booth 306



Exhibitor Profiles

Benefield Anechoic Facility

412 TW Benefield Anechoic Facility (BAF) at the Air Force Test Center, Edwards AFB

The BAF provides a robust RF T&E infrastructure to ensure system survivability and mission effectiveness for the DoD, industry and allies. The largest anechoic test facility provides a secure “virtual open-air RF range within four walls” — a valuable tool providing test engineering applied to the development and the T&E of RF systems. We conduct Antenna Pattern, EW/IO, Survivability, Electromagnetic Interoperability and Electromagnetic Environmental Effects (E3) tests. The uniquely large and well-equipped BAF offers a highly flexible and scalable indoor antenna range and test capability for installed and uninstalled antenna systems across a wide spectrum.

(<http://www.edwards.af.mil/units/772ndtestsquadron>)

Booth 116



Boeing Technology Services (BTS)

As the centrally-managed test and evaluation organization of The Boeing Company, Boeing Test & Evaluation verifies and validates the company's products and services operate as designed and meet the rigorous requirements of regulatory agencies and Boeing customers. BT&E leverages the expertise of its global team to test a large variety of products, including commercial airplanes, rotorcraft, unmanned aircraft, tankers, fighters, airlifters, space systems, network-centric systems and more. Headquartered in Seattle, Wash., BT&E has several flight test centers and more than 250 lab test environments around the world. Its largest operational centers are in Seattle; Southern California; St. Louis; and Philadelphia.

Booth 406

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Exhibitor Profiles

Chamber Services, Inc.

Chamber Services Inc. is a forward-thinking, anechoic facility design, construction, and services company committed to delivering the highest level of service and superior-quality products to valued customers.

Our services include anechoic chamber design, consultation, and construction including architectural, modular, and welded RF shielded enclosure installations/relocations, RF shielded enclosure maintenance, RF absorber material removal/ installation, RF absorber material maintenance, RCM and pneumatic RF shielded door installation and maintenance, and zinc and copper coatings flame spray service.

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Chamber Services, Inc., in association with the leading RF shielding and RF absorber manufacturers, provides a factory direct source for RF shielded enclosures, RF shielded doors, RF absorber materials, power and signal line filters, waveguides, pipe penetrations, custom test fixtures, portable RF absorber panels, and much more.

www.chamberservicesinc.com

Booth 109




chamber services inc.

CompuQuest,inc

CompuQuest provides custom, high quality instrument control, data acquisition, and signal processing software, emphasizing radar cross section (RCS) and antenna measurement applications. The Quest series of data acquisition systems contain drivers for controlling hardware devices ranging from obsolete network analyzers to the latest Agilent PNA systems. CompuQuest data analysis systems process and display data from an industry-wide selection of raw data files. Together with System Planning Corporation, CompuQuest has developed the PNA-based Cheetah RCS and Antenna Measurement System. This product base, and extensive hardware and software backgrounds, makes CompuQuest uniquely qualified to handle the needs of the measurement community.

Booth 310

CompuQuest,inc



6226 Old Franconia Road, Suite B
Alexandria, VA 22310
703.971.6504
cquest@cquest.com

Exhibitor Profiles

Comtest Engineering/DMAS

Comtest Engineering supplies high performance anechoic chambers, reverberation chambers and RF shielded rooms. Comtest is a privately owned, second generation family business and was founded in 1985. We are a professional organization and recognized for quality and flexibility. Our high performance RF shielded doors, mode-stirrer systems and polystyrene microwave absorbers have been internationally recognized as state of the art products.

The comprehensive turnkey test chamber solutions we offer:

- Anechoic chambers (EMC and Microwave)
- Anechoic chamber upgrades
- Reverberation chambers
- RF shielded rooms & doors

Comtest team is dedicated to satisfy your need to control the electromagnetic environment!

Booth 209

COMTEST[®]
ENGINEERING

 **DMAS**
DUTCH MICROWAVE
ABSORBER SOLUTIONS

Copper Mountain Technologies

Based in Indianapolis, Indiana, Copper Mountain Technologies has transformed vector network analyzers (VNAs) with its affordable, lab-grade test systems that provide fast, highly accurate measurements from portable designs. Well-suited for a variety of RF and microwave applications from 20 kHz to 20 GHz, these VNAs offload their processing functions to an external PC for easy data management and analysis. Recipient of the 2015 Frost & Sullivan Global Competitive Strategy Innovation and Leadership Award, Copper Mountain Technologies also backs each of its VNAs with expert service and support for customers around the world. Visit CopperMountainTech.com or call +1.317.222.5400 to learn more.

Booth 405



COPPER MOUNTAIN
TECHNOLOGIES

Exhibitor Profiles

CST of America, Inc.

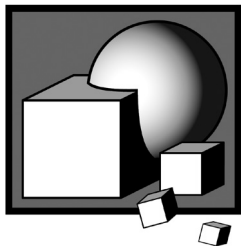
CST develops and markets high-performance software for the simulation of electromagnetic fields in all frequency bands. Its success is based on the implementation of unique, leading-edge technology in a user-friendly interface. CST's flagship product, CST MICROWAVE STUDIO® facilitates fast and accurate simulation of high-frequency applications including antennas, filters, multi-layer structures, SI, and EMC.

www.cst.com

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CST



Delta Sigma Company

DSC began operations in January of 1990 in Hesperia, California. In July of 1997, we moved to Kennesaw, Georgia to be closer to the F-22 Raptor team which had moved from Palmdale, CA to Marietta, GA. We have over 40 years worth of experience in-house for all kinds of specialized LO (low observables) testing. We have built everything from the antenna to the cal target, radar, data collection & processing software, RF section, pylon elevator, pylon, multi-axis target positioner, target, and motion controls for moving parts in/on the target.

At DSC, we engineer all of our own designs and software and build all of our machines in-house from the ground up.

Booth L04



Exhibitor Profiles

ECS-Federal, LLC

54 ECS designs, manufactures, and installs advanced instrumentation radar systems, including custom antenna positioners, for precision RF scattering measurements. ECS's current fifth generation MkV e radar debuted in late-1996 and over 41 systems have since been sold to US and foreign customers for fixed-site, mobile and airborne configurations and applications. ECS's sixth generation system, the Sabre, debuted in 2016. ECS leases deployable instrumentation radars, with support personnel for in-field measurements at customer facilities, test ranges or remote locations. ECS leases an indoor RF facility to industry and government for quick-look or full-measurement programs. ECS develops and uses algorithms and software for radar signal and image processing. ECS also designs and develops Radar Threat Emulator/Simulator systems.

Booth 311



EMSCAN

EMSCAN has provided electromagnetic very-near-field test equipment to Design, Verification and Compliance Engineers since 1989 using a patented planar grid array of antennas. Our solutions create visual representations of electromagnetic values in real-time and offer unique, extremely fast and cost effective solutions to complex problems facing PCB and Antenna Engineers today.

RFxpert is the only real-time, compact, bench-top antenna measurement equipment that calculates accurate far-field patterns and radiated power levels based on near-field measurements.

EMxpert is a real-time, compact, bench-top EMC/EMI diagnostic tool enabling designers to rapidly diagnose and solve EMC/EMI problems in a single design cycle.

Booth 205



Exhibitor Profiles

ETS-Lindgren

ETS-Lindgren Antenna Measurement Systems provide engineers and test labs with the ability to meet today's design and test challenges. We offer RF and Microwave Far Field, Near Field, and Compact Range chambers for RCS and Hardware-in-Loop (HiL) applications as well as Wireless Systems for LTE and MIMO performance testing. Our well-known antennas are available in standard and custom designs. As an end-to-end integrated supplier, we offer RF and microwave absorber, multi-axis positioners, field probes and monitors, to name a few. Turn-key system solutions feature EMQuest™ software for fully automated 2- and 3-D antenna pattern measurement for passive antennas and active wireless devices.

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Booth 110

 **ETS • LINDGREN**®
An ESCO Technologies Company

EurAAP

The European Association on Antennas and Propagation, EurAAP, was created in the frame of the European Framework Program FP6 (2002-2006) and registered in Brussels, Belgium, in November 2005 as a non-profit association (EurAAP AISBL).

EurAAP is the point of reference of the European Antenna & Propagation scientific community. Its main objectives can be listed as follows:

- 1) Organize (since 2006) the European Conference on Antennas and Propagation EuCAP, as well as related European workshops and other associated events; see www.eucap2017.org for the next edition in Paris, France, 19-24 March 2017,
- 2) Support the European School of Antennas (www.esoa-web.org) and connected Master & PhD programs on Antennas and Propagation;
- 3) Encourage and financially support European research and networking activities in Antennas & Propagation, through a series of specifically dedicated working groups.

EurAAP is governed by a Assembly of Delegates, democratically elected among the EurAAP members for a three-year term. Delegates include representatives of geographical regions as well as working groups leaders and representatives of other institutions relevant to our community.

See www.euraap.org for additional information.

Booth L01.A



Exhibitor Profiles

IEEE Antennas & Propagation Society

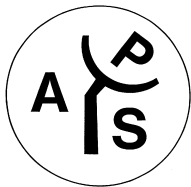
The Antennas and Propagation Society (AP-S) encompasses antennas, including analysis, design, development, measurement, and testing; radiation, propagation, and the interaction of electromagnetic waves with discrete and continuous media; and applications and systems pertinent to antennas, propagation, and sensing, such as applied optics, millimeter- and sub-millimeter- wave techniques, antenna signal processing and control, radio astronomy, and propagation and radiation aspects of terrestrial and space-based communication, including wireless, mobile, satellite, and telecommunications.

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The Society has approximately 8,000 members worldwide and publishes several peer-reviewed, archival journals. The 2017 IEEE International Symposium on Antennas and Propagation and USNC/URSI National Radio Science Meeting will be held July 9-15 in San Diego, California, USA.

For more information on the AP-S, visit www.ieeeaps.org. The 2017 Symposium web site is www.2017apsursi.org.

Booth L01.B



Keysight Technologies

(formerly Agilent Technologies)

The AMTA event will showcase antenna measurement related products and services including RF/microwave components, cables, antennas, instrumentation, test environments and software tools. AMTA attendees and sponsors come from a variety of backgrounds including industry, government, and educational institutions. Keysight's booth will feature antenna and radar measurement solutions including PNA-X, UXG SigGen, and the PXIe Vector Network Analyzer.

Booth 307



Exhibitor Profiles

Liberty Calibration, LLC

With locations in the Midwest and Canada, Liberty Calibration provides a solution for all of your accredited calibration needs from mechanical/dimensional and general electronic instrumentation to RF/EMI/EMC instrumentation. We provide these services at one of our locations or on-site at your facility, and we work to build long lasting relationships with our customers to ensure the highest quality in our services. We offer quality calibrations with documentation that satisfies your industry and regulatory requirements, and 24/7 web access to your calibration certificates. Please contact us at 712-764-2197 for any of your calibration needs.

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Booth 408



MICRO-COAX

For more than 50 years, Micro-Coax has been a leader in providing highly reliable products for the Test and Measurement industry. As a small business, Micro-Coax has a broad portfolio of custom solutions for your requirements. We have the capability to provide custom, cost-effective, cable, connectors, cable assemblies and EMI Shielding products to meet your most demanding applications.

Micro-Coax is known for reliability, service and product quality throughout the industries it serves. Our state-of-the-art, 92,000 sq. ft. facility is located in Pottstown, Pennsylvania. When reliability matters, you can count on Micro-Coax to provide custom solutions to complex transmission line challenges.

Tabletop L06

MICRO-COAX  [®]

Exhibitor Profiles

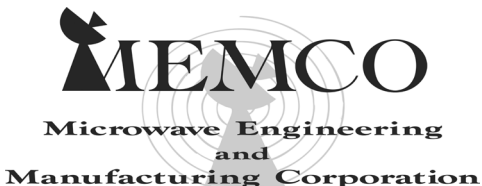
Microwave Engineering and Manufacturing Corporation

Microwave Engineering and Manufacturing Corporation (MEMCO) is a small business which produces high quality space flight hardware on a quick response and low cost basis. MEMCO has flight qualified antenna feeds on eighty-six spacecrafts. Capabilities include RF design and analysis, fabrication services, and RF testing. Test facilities include a 20-foot rectangular anechoic chamber, a 13' x 13' vertical/cylindrical near-field scanner, and a thermal test chamber. In addition, MEMCO designs and fabricates custom RF test probes for anechoic chambers, compact ranges, and near-field scanners.

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MEMCO works in cooperation with our customers to ensure that our products are best suited to the specific customer application.

Padre Island Room



The Microwave Vision Group

The Microwave Vision Group (SATIMO, ORBIT/FR, AEMI and REMC), specialists in microwave scanning technology delivers a range of innovative measurement solutions for antenna, RCS, and radome testing as well as EMC testing and wireless device certification.

We provide a large range of near field or far field test systems. Turn-key or various components: multi-probe or mono probe scanners, chambers, antennas, positioners, controllers, RF absorbers, and more. Our know-how also expands into industrial material inspection and RF monitoring. MVG strengths are a broad product portfolio, worldwide presence, and integrated project management. We are dedicated to supporting the Aerospace and Defense, Satellite, Telecom, and Automotive industries and well as academic R&D. www.mvg-world.com

Booth 301



Exhibitor Profiles

NSI-MI Technologies

64 With over 1000 systems sold worldwide, NSI-MI Technologies offers a comprehensive range of industry leading microwave test systems. These systems cover antennas, radomes and RCS and our unique blend of mechanical, RF and software engineering capabilities allow us to customize test systems to offer specialized solutions. NSI-MI supports the aerospace/defense, automotive, wireless and academic industries. Our wide range of products also allow us to offer solutions for material, production line or general automated component testing. Our global presence enables us to offer the highest quality service and support to ensure long term use of all test products supplied. We also offer extensive in-house test and measurement facilities covering frequencies from 250 MHz to 110 GHz.

Booth 101



Orbital ATK

Orbital ATK Military Systems is dedicated to the advancement of aerospace composite antennas, radomes, and structures. Our group features over 20 years of experience in the design, development, fabrication, and test of military products. Orbital ATK performs analytical modeling and characterization of RF products and operates an indoor compact range in Dayton, Ohio and one in Rancho Bernardo, CA. The Dayton, Ohio compact range operates from 200 MHz to 40 GHz, with a 12 ft. cubic quiet zone above 400 MHz while the Rancho Bernardo, CA facility is the second largest indoor compact range in the United States and operates from 300MHz to 18 GHz with a 30 ft. quiet zone. Both facilities perform contracted measurement services, upon request.

Orbital ATK is a premier aerospace and defense company with over 12,000 employees in 20 states, Puerto Rico, and internationally, with revenues in excess of \$4.8 billion. News and information may be found on the internet at: www.orbitalatk.com.

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Exhibitor Profiles

Planar Monolithics Industries, Inc.

Planar Monolithics Industries, Inc (PMI) was founded in 1989 and is a vertically integrated manufacturing operation; we possess the technology and talent to meet the needs of today's ever changing requirements. From very sophisticated Integrated Microwave Modules to Ultra-High Speed or High Isolation Solid State Switch/Modulators, Variable Attenuators, Phase Shifters and IQVMs, PMI can satisfy your company's needs.

Booth L03



PPG Aerospace / Cuming Microwave

Cuming Microwave is a worldwide leader in the design, construction and installation of RF anechoic chambers. Since 1985, we have been providing solutions to the most demanding requirements for EMC, antenna, RCS and PIM chambers. We manufacture advanced low-loss and RF absorbing materials for a variety of military and commercial applications, including electronics and telecom, antenna components, low observables and EMC compliance. Cuming Microwave is ISO9001 and AS9100 certified.

Please see our website: www.cumingmicrowave.com

Booth 401



PPG Aerospace
Cuming Microwave

Exhibitor Profiles

QuarterBranch Technologies, Inc.

QuarterBranch Technologies, Inc. serves the RCS community. Our flagship product, RadarMan, is a compact, lightweight, 2-18 GHz Pulsed-IF system. Despite its small footprint, RadarMan features most of the capability of its much larger, more costly competitors. RadarMan is adaptable to virtually any required measurement configuration for outdoor ranges, indoor compact ranges, or portable field testing.

With our system support business, we offer our customers a unique combination of industry knowledge and experience. Our staff is able to help customers in planning and carrying out system acquisitions, upgrades, capabilities evaluations, facility modernization, instrumentation maintenance and measurement program planning and execution.

www.quarterbranch.com

Booth 118



QuarterBranch
Technologies, Inc.

Electronic Instrumentation Systems and Services

Raytheon

Raytheon Space and Airborne Systems builds radars and other sensors for aircraft, spacecraft and ships. The business also provides communications and electronic warfare solutions and performs research in areas ranging from linguistics to quantum computing.

Capabilities include:

- Electronic Warfare
- Command and Controls
- Sensors and Imaging
- Missile Defence
- Training and Services

Tabletop L10

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Raytheon

Exhibitor Profiles

Remcom

Electromagnetic Simulation Solutions

Remcom provides innovative EM simulation software and consulting services. XFDTD®, our full wave 3D EM solver, simplifies the analysis of complex EM problems and leads the market in FDTD-based modeling and simulation. Used together, our tools ensure proper design and placement of antennas in almost any application. Models can be analyzed for efficiencies, dissipated power, SAR, radiation patterns, and more.

Remcom's products are used for antenna design, bio/EM effects, MRI, microwave circuits, RFID, military and defense applications, EMC/EMI, and more. In addition, our talented staff of engineers is available to collaborate on your most challenging problems.

Learn more at www.remcom.com.

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Rohde & Schwarz

For more than 80 years, Rohde & Schwarz has stood for quality, precision and innovation in all fields of wireless communications. The privately owned company is strategically based on five pillars: test and measurement, broadcast and media, secure communications, cybersecurity, radiomonitoring and radiolocation. The electronics group, headquartered in Munich (Germany), has a global presence and is among the world market leaders in all of its business fields. Learn more by visiting www.rohde-schwarz.com/us

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ROHDE & SCHWARZ

Exhibitor Profiles

Sprinkler Innovations

Sprinkler Innovations' makes the only FM approved retractable telescoping sprinkler heads for anechoic chambers. These sprinklers bring effective, time-saving fire control technology to the anechoic chambers by automatically retracting after a system test or false activation and resetting itself above the ceiling. This allows you to test the entire sprinkler system without anyone entering the chamber. Start-to-finish trip test time is only two hours! Minimize disruptions and maximize profits with an extraordinary fire protection solution for anechoic chambers. Sprinkler Innovations offers fire protection for the most demanding environments.

72 www.sprinklerinnovations.com

Booth 411

SPRINKLER INNOVATIONS

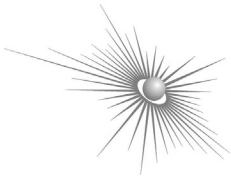
SI

RETRACTABLE TELESCOPING SPRINKLER HEADS

STAR Dynamics Corporation

STAR Dynamics Corporation, under new ownership as a Veteran Owned Small Business, has reenergized as the key provider of leading-edge Instrumentation Radars for several defense industries. STAR has strengthened its commitment to the Low-Observable community with highly enhanced BlueMax RCS/Imaging Radars and Knowbell™ Signal Processing technologies. Precision, multi-object tracking radars for flight-test ranges are being introduced, leveraging industry-recognized subject matter expertise to enhance defense technology development/validation. STAR continues to provide premium aftermarket support with unmatched product capability/reliability. Heavy reinvestment the past year, provides a decade of innovation for leading-edge technology in the best interest of its customers and national defense.

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STAR DYNAMICS
CORPORATION

Exhibitor Profiles

TDK Corporation

TDK RF Solutions is a world leader in the design, development & manufacture of technical solutions for the EMC testing and Antenna measurement industries. We offer a complete range of solutions including automated test systems, anechoic chambers, RF absorber, antennas, software, RF filters, and a wide range of test products & accessories. We call it Total System Technology®, and it means TDK RF Solutions is your best choice of partner for proven solutions & services. If you are in the market for a complete turnkey solution or looking to expand your test capabilities with a new antenna, contact us to see what TDK can do for you.

Booth 308

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TICRA

TICRA has more than 40 years of experience in developing trusted solutions to the aerospace industry. We are the world's leading supplier of software for the RF-modeling of reflector antenna systems from simple user terminals to advanced satellite systems. The applications span from coverage planning over the detailed antenna design to the processing of radiation pattern measurements. TICRA also offers consultancy in antenna design and regularly participates in international projects including numerous projects for the European Space Agency.

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TICRA

Exhibitor Profiles

Virginia Diodes Incorporated (VDI)

Virginia Diodes Inc. manufactures state-of-the-art test and measurement equipment for mm-wave and THz applications. These products include Vector Network Analyzer, Spectrum Analyzer and Signal Generator Extension Modules that extend the capability of high performance microwave measurement tools to higher frequencies. VDI's component products include detectors, mixers, frequency multipliers and custom systems for reliable operation at frequencies between 50 GHz and 2 THz. VDI components include in-house fabricated GaAs Schottky diodes and Microelectronic devices; visit www.virginiadiodes.com.

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Supporting Publications

IN Compliance Magazine

In Compliance Magazine features in-depth coverage of worldwide regulatory compliance issues for the electronics industry. Each month you'll find technical articles from industry leading authors on topics related to test and design, standards updates and changes, products, services, and more! Available in print or digitally, we offer a variety of informational resources for the electrical engineering professional. Visit our website, activate your free subscription, and join one of our many eNewsletters for regular updates.

www.incompliancemag.com

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IN COMPLIANCE
Magazine

Supporting Publications

Microwave Journal

Microwave Journal provides leading-edge technical content for RF, microwave and wireless engineers worldwide. MWJ the magazine reaches 50,000 qualified subscribers globally with practical design application articles for working engineers, the latest product features, news and analysis. MWJournal.com delivers the latest news, events, webinars, white papers, blogs, video and newsletters to RF/microwave professionals everywhere. For more than 57 years, Microwave Journal has been THE resource for the engineers who are developing the latest technologies for the high frequency electronics sector.

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Literature Bin



Frequency Matters.

Microwave Product Digest

MPD/Microwave Product Digest is the premier new product magazine devoted to information on components, equipment, and subsystems for the RF, microwave, and wireless industries. Each issue provides news, data, and application information that engineers and engineering managers working in commercial or military markets can use to develop their products. Microwave Product Digest made its debut in 1989, bringing “a trade show in print” to our readers every month. Throughout the past two decades, we’ve become a respected source of the latest product introductions, along with solid feature articles. MPD also produces several product specification supplements annually. These are directed to the areas of amplifiers, signal sources, and cables and connectors. Our newest supplement is a bi-annual publication focused on the military market—Military Microwave Digest. MMD is comprised of articles about the microwave products and technology driving today’s defense electronic systems. The Microwave Product Digest website has just been redesigned to deliver more of what our readers need including relevant white papers, staff-written perspectives on current topics, continuously-updated technology, and market news.

www.mpdigest.com

Literature Bin



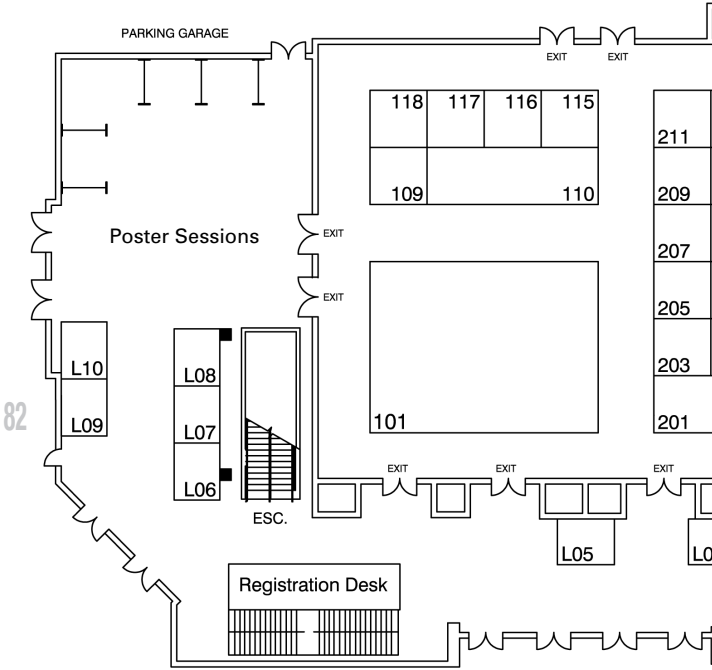
MPD MICROWAVE
PRODUCT DIGEST

Vendor Locations

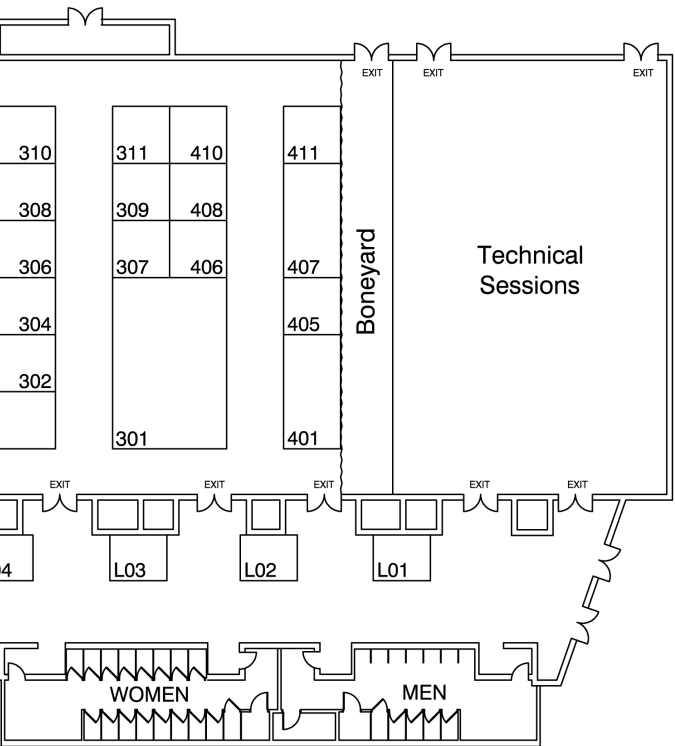
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Zilker Ballroom and Foyer



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