Welcome to San Diego!

Welcome to San Diego and thank you for joining us for the 41st Annual Antenna Measurement Techniques Association Symposium. Best known in the past for its beautiful beaches and perfect year-round weather, San Diego today has gained a reputation as an innovation hub thanks to a combination of top-notch universities, world-renowned research institutes, and technology startups. Our venue for this year’s meeting, the Sheraton San Diego Hotel & Marina, is located on the waterfront of Harbour Island and offers attendees the perfect location to experience and explore all that San Diego has to offer.

Our technical program kicks off on Sunday October 6th with this year’s Short Course, “5G Antenna Design, Application and Measurement Challenges”, focusing on modern-day smart antennas, new test standards, and measurement techniques currently being developed for this application. Held in conjunction with the Short Course will be our popular Back-to-Basics Boot Camp, which covers measurement fundamentals and taught by industry experts. On Monday morning, Distinguished Professor, Dr. Zoya Popovic, will present this year’s Keynote, “Multi-beam Phase-Shiftierless Antenna Array and Free-space Measurements”. The other invited speakers for the week will be: Dr. Philippe Garreau (CEO, Microwave Vision Group), who will present on Tuesday; Invited speaker from EuRAp, Dr. Elena Saenz (European Space Agency), presenting on Wednesday morning, followed later in the day by our Lunch & Learn presenter, Dr. Daniel Sievenpiper (UCSD); and finally, our invited speaker from IEEE AP-S, Dr. J. Ch. Bolomey (Emeritus Professor, University Paris Saclay) will present on Thursday. We will close out the week with our Friday Technical Tour of the historic and iconic USS Midway Aircraft Carrier and Museum.

Expect a full social calendar! Start the week out on Sunday morning with an invigorating 5K walk or run around the harbor waterfront, sponsored by ETS-Lindgren. The Welcome Reception, sponsored by NSI-MI, will be held Sunday evening in the Shoreline Pavilion overlooking the Sheraton San Diego Marina. The Monday night event, sponsored by MVG, will be held at the San Diego Air & Space Museum in beautiful Balboa Park. Join us for a strolling pre-dinner reception through the exhibit area, pilot your own aircraft in one of the flight simulators, and tour the museum’s workshop where many of the aircraft displayed are refurbished right on-site. Wednesday evening is the Annual Awards Banquet, sponsored by the Microwave Vision Group. Our companion tours include visits to historic Old Town San Diego, the world-renowned San Diego Safari Park, and nearby Coronado Island.

October is a wonderful time to visit Southern California. Moderate temperatures, abundant sunshine, and minimal rainfall beckon visitors to enjoy the many surrounding attractions and outdoor activities. The Sheraton San Diego Hotel & Marina is located on the waterfront, minutes from San Diego International Airport. Enjoy walking or cycling on the many waterfront pathways or take a boat tour and experience San Diego from the water.

On behalf of the organizing committee, the Microwave Vision Group, and San Diego State University, we extend our warm greetings and thank you for attending AMTA 2019.

Kim Hassett, AMTA 2019 Host Committee Chair
<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday, October 5th</td>
<td></td>
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<tr>
<td>8 a.m. - 6 p.m.</td>
<td>Exhibit Room Set-up (for Exhibitors with 4 or more booths)</td>
<td>Grande Ballroom B/C</td>
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<tr>
<td>Sunday, October 6th</td>
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<tr>
<td>7 - 8:30 a.m.</td>
<td>5k Walk/Run</td>
<td>Sheraton Marina Tower Lobby</td>
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<tr>
<td>7:00 a.m. - 5 p.m.</td>
<td>AMTA Registration</td>
<td>Marina 4/5 Foyer</td>
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<tr>
<td>7:30 - 8:30 a.m.</td>
<td>Short Course &amp; Boot Camp Breakfast</td>
<td>Harbor Island 3</td>
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<tr>
<td>8:30 a.m. - 9:45 p.m.</td>
<td>Short Course</td>
<td>Marina 6</td>
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<tr>
<td>8:30 a.m. - 6 p.m.</td>
<td>Boot Camp</td>
<td>Spinnaker</td>
</tr>
<tr>
<td>8 a.m. - 6 p.m.</td>
<td>Exhibit Room Set-up (for all exhibit spaces)</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>12:15 - 1:30 p.m.</td>
<td>Short Course &amp; Boot Camp Lunch</td>
<td>Harbor Island 3</td>
</tr>
<tr>
<td>6 - 7:30 p.m.</td>
<td>Welcome Reception</td>
<td>Shoreline Pavilion &amp; Lani Area</td>
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<tr>
<td>Monday, October 7th</td>
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<tr>
<td>7 a.m. - 5 p.m.</td>
<td>AMTA Registration</td>
<td>Marina 4/5 Foyer</td>
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<tr>
<td>7 - 8 a.m.</td>
<td>Breakfast</td>
<td>Bayview Lawn</td>
</tr>
<tr>
<td>8 - 10 a.m.</td>
<td>Companion Suite Breakfast</td>
<td>Marina 1</td>
</tr>
<tr>
<td>8 - 9:06 a.m.</td>
<td>Conference Opening and Keynote Speaker</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>9:06 - 10 a.m.</td>
<td>Session 1</td>
<td>Grande Ballroom A</td>
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<tr>
<td>10 - 10:30 a.m.</td>
<td>Morning Break</td>
<td>Grande Ballroom B/C</td>
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<tr>
<td>10:30 - 11:24 a.m.</td>
<td>Session 2</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>10:30 a.m. - 4 p.m.</td>
<td>Companion City &amp; Old Town Tour</td>
<td>Sheraton Marina Tower Lobby</td>
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<tr>
<td>10 a.m. - 5 p.m.</td>
<td>Exhibits Open</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>11:30 a.m. - 1:30 p.m.</td>
<td>Exhibitor Sponsored Lunch</td>
<td>Grande Ballroom B/C &amp; Foyer</td>
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<tr>
<td>1:30 - 3 p.m.</td>
<td>Session 3</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>3 - 3:30 p.m.</td>
<td>Afternoon Break</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>3:30 - 5 p.m.</td>
<td>Session 4</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>6 - 9:30 p.m.</td>
<td>Monday Night Outing</td>
<td>San Diego Air &amp; Space Museum</td>
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<tr>
<td>Tuesday, October 8th</td>
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<tr>
<td>7 a.m. - 11:30 a.m.</td>
<td>AMTA Registration</td>
<td>Marina 4/5 Foyer</td>
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<tr>
<td>7 - 8 a.m.</td>
<td>Breakfast</td>
<td>Bayview Lawn</td>
</tr>
<tr>
<td>8 - 10 a.m.</td>
<td>Companion Suite Breakfast</td>
<td>Marina 1</td>
</tr>
<tr>
<td>8 - 8:30 a.m.</td>
<td>Invited Speaker</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>8:30 - 9:30 a.m.</td>
<td>Session 5</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>9:30 - 10 a.m.</td>
<td>Morning Break</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>10 - 11:30 a.m.</td>
<td>Session 6</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>10:00 a.m. - 4:30 p.m.</td>
<td>Companion San Diego Safari Park Tour</td>
<td>Sheraton Marina Tower Lobby</td>
</tr>
<tr>
<td>9 a.m. - 5 p.m.</td>
<td>Exhibits Open</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>11:30 a.m. - 7 p.m.</td>
<td>Student Day Activities</td>
<td>Spinnaker</td>
</tr>
<tr>
<td>11:30 a.m. - 1:30 p.m.</td>
<td>Business Lunch (Exhibits closed)</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>1:30 - 3 p.m.</td>
<td>Session 7</td>
<td>Grande Ballroom A</td>
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<tr>
<td>1:30 - 5 p.m.</td>
<td>AMTA Registration</td>
<td>Marina 4/5 Foyer</td>
</tr>
<tr>
<td>3 - 3:30 p.m.</td>
<td>Afternoon Break</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>Thursday, October 9th</td>
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<tr>
<td>7 a.m. - 5 p.m.</td>
<td>AMTA Registration</td>
<td>Marina 4/5 Foyer</td>
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<tr>
<td>7 - 8 a.m.</td>
<td>Breakfast</td>
<td>Bayview Lawn</td>
</tr>
<tr>
<td>8 - 10 a.m.</td>
<td>Companion Suite Breakfast</td>
<td>Marina 1</td>
</tr>
<tr>
<td>8 - 8:30 a.m.</td>
<td>Invited EurAAP Speaker</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>8:30 - 9:24 a.m.</td>
<td>Session 9</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>9:24 - 10 a.m.</td>
<td>Morning Break</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>9:30 a.m. - 2:30 p.m.</td>
<td>Companion Hotel Del Coronado Tour</td>
<td>Sheraton Marina Tower Lobby</td>
</tr>
<tr>
<td>9 a.m. - 4:30 p.m.</td>
<td>Exhibits Open</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>10 - 11:30 a.m.</td>
<td>Session 10</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>12 - 1:30 p.m.</td>
<td>Lunch &amp; Learn</td>
<td>Grande Ballroom A</td>
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<tr>
<td>1:30 - 4:30 p.m.</td>
<td>IEEE Day - Free admission to Exhibit Hall for all IEEE members (please bring proof of membership)</td>
<td>Grande Ballroom B/C</td>
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<tr>
<td>1:30 - 3 p.m.</td>
<td>Session 11</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>3 - 3:30 p.m.</td>
<td>Afternoon Break</td>
<td>Grande Foyer</td>
</tr>
<tr>
<td>3:30 - 5 p.m.</td>
<td>Session 12 - Poster Session 2</td>
<td>Grande Foyer</td>
</tr>
<tr>
<td>4:30 - 7:30 p.m.</td>
<td>Exhibitor Tear-down</td>
<td>Grande Ballroom B/C</td>
</tr>
<tr>
<td>6:30 - 7:30 p.m.</td>
<td>Banquet Reception</td>
<td>Bayview Lawn</td>
</tr>
<tr>
<td>7:30 - 10:00 p.m.</td>
<td>Banquet Awards Dinner</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>Friday, October 11th</td>
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<tr>
<td>8:15 a.m. - 2 p.m.</td>
<td>Technical Tour - USS Midway</td>
<td>Sheraton Marina Tower Lobby</td>
</tr>
<tr>
<td>11:30 a.m. - 1:30 p.m.</td>
<td>IEEE Working Group Meeting</td>
<td>Marina 3</td>
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<tr>
<td>12:30 - 1:30 p.m.</td>
<td>Session 15</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>1:30 - 3 p.m.</td>
<td>Session 16</td>
<td>Grande Foyer</td>
</tr>
<tr>
<td>3 - 3:30 p.m.</td>
<td>Afternoon Break</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>3:30 - 5 p.m.</td>
<td>Session 16</td>
<td>Grande Ballroom A</td>
</tr>
<tr>
<td>5 - 5:05 p.m.</td>
<td>Closing Remarks</td>
<td>Grande Ballroom A</td>
</tr>
</tbody>
</table>
Exhibit Dates and Hours

SET-UP
Saturday, October 5
8:00 a.m. – 6:00 p.m.
for Exhibitors with 4 or more booths.

Sunday, October 6
8:00 a.m. – 6:00 p.m.
for all exhibit spaces.

EXHIBITION
Monday, October 7
10:00 a.m. – 5:00 p.m.

Tuesday, October 8
9:00 a.m. – 5:00 p.m.
Please note: Exhibits are closed during Tuesday’s AMTA Business Lunch from 11:30 a.m. – 1:30 p.m.

Wednesday, October 9
9:00 a.m. – 4:30 p.m.

DISMANTLE
Wednesday, October 9
4:30 p.m. – 7:30 p.m.

Thursday, October 10
8:30 a.m. – 3:00 p.m.
Empty Crates will be delivered Thursday morning, October 10th at 7:00 a.m.

Exhibitor Reception*

TUESDAY, OCTOBER 8 / 5:30 – 6:30 P.M.
The purpose of the reception is to thank the exhibitors for their support of AMTA and solicit feedback on how AMTA can improve the exhibitor experience at its annual symposium. Join us for cocktails and appetizers. An overview of AMTA 2019 will be presented along with information on upcoming AMTA events.

* By Invitation Only: An invitation to the reception along with the specified meeting location will be provided to each exhibitor on site at AMTA 2019.
Social Calendar

Welcome Reception

SUNDAY, OCTOBER 6 / 6:00 - 7:30 P.M.
• Sponsored by: NSI-MI Technologies
• Complimentary to all registered symposium participants and their companions

Please join us for appetizers, cocktails, and some casual socializing at the Marina Tower Shoreline Pavilion, located on the beautiful waterfront of the Sheraton San Diego Hotel & Marina.

5K Walk/Run

SUNDAY, OCTOBER 6 / 7:00 - 8:30 A.M.
• Sponsored by: ETS-Lindgren
• Price: $20, includes hat, finisher medal, and post-race celebration
• Meet in the Sheraton San Diego Hotel & Marina Lobby

Ready. Set. GO register for this year’s 5K AMTA Fun Run! This is an awesome way to kick-off your symposium week by joining your AMTA colleagues for a morning jaunt along the beautiful Pacific Coastline. Our host hotel is conveniently located on scenic Harbor Island which provides stunning San Diego Harbor views, ocean breezes and seagull escorts as we take advantage of the many paths to stretch our land-legs. All participants will receive a stylish hat and finisher medal, plus we will celebrate with an after-race party inclusive of our annual post-race photograph so you have proof that you indeed “Survived the AMTA 5K”!

Friday Technical Tour

USS MIDWAY MUSEUM

OCTOBER 11 / 8:15 A.M. - 2:00 P.M.
• Price: $65, includes transportation and tour
• Meet in the hotel lobby for group transport via chartered bus

The USS Midway is one of America’s longest serving aircraft carriers. Today, she sits as a majestic and historic reminder of one of the most challenging periods in United States history. Commissioned a week after the end of World War II, Midway was the largest ship in the world until 1955, as well as the first U.S. aircraft carrier too big to transit the Panama Canal. She operated for 47 years, during which time she saw action in the Vietnam War and served as the Persian Gulf flagship in 1991’s Operation Desert Storm. Decommissioned in 1992, she is now a museum ship docked permanently in San Diego, California. With more than 30 restored aircraft, and nearly 10 acres of exhibits and displays, the Midway brings you the most complete cross-section of carrier aviation in the world. From high up on the bridge down to the main engine room, let us take you on a unique warship journey that engages the sights, sounds, and aromas of this symbol of American freedom. A volunteer Docent will guide our group through selected areas of the ship, afterwards which you are invited to explore the exhibits and activities at your leisure. Don’t miss the “Voices of Midway” film detailing the events of the Battle of Midway!

Monday Night Outing

SAN DIEGO AIR & SPACE MUSEUM

MONDAY, OCTOBER 7 / 6:00 - 9:30 P.M.
• Sponsored by: MVG
• Price: $90
• Meet in the hotel lobby for group transport via chartered bus

Let’s Fly! On Monday evening we’ll transport you to the San Diego Air & Space Museum located in Balboa Park, San Diego’s historic park on the hill.

Science, space and aviation history all unfold at the San Diego Air & Space Museum - California’s official air and space museum. An affiliate of the Smithsonian Institution, the museum houses a collection of historic aircraft and spacecraft from all over the world, including a flight-worthy replica of Charles Lindbergh’s “Spirit of St. Louis,” the actual Apollo 9 Command Module, and the only real GPS satellite on display in the world. View artifacts from the Wright Brothers, Charles Lindbergh, Amelia Earhart, Neil Armstrong, Buzz Aldrin, Wally Schirra and other aviation and space pioneers!

We’ll have the opportunity to visit the museum and test the pilot-in-me sensations in the MaxFlight® simulators, before sitting down to a lovely dinner in the Atrium with aircraft “flying” overhead.

Welcome Reception

SUNDAY, OCTOBER 6 / 6:00 - 7:30 P.M.
• Sponsored by: NSI-MI Technologies
• Complimentary to all registered symposium participants and their companions

Please join us for appetizers, cocktails, and some casual socializing at the Marina Tower Shoreline Pavilion, located on the beautiful waterfront of the Sheraton San Diego Hotel & Marina.

Awards Banquet

WEDNESDAY, OCTOBER 9 / 6:30 - 10 P.M.
• Sponsored by: MVG
• Price: Included in full registration, extra ticket $85 per person

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

San Diego City Tour with Stop in Historic Old Town

MONDAY, OCTOBER 7 / 10:30 A.M. - 4:00 P.M.
- Price: $85
- Meet at the Sheraton Marina Tower Lobby at 10:15 a.m.

The day starts with a 1.5 hour city tour, including the San Diego waterfront, Seaport Village, Gaslamp Quarter, Balboa Park, and Little Italy. The tour ends in historic Old Town San Diego where you will enjoy lunch on the outdoor patio of the Barra Barra Restaurant. Following lunch you will have time to tour the historic park on your own, along with an opportunity to shop at some of the local stores.

Dating to 1769, Old Town San Diego is the site of California’s first European settlement and considered the birthplace of California. Old Town San Diego State Historic Park, with its preserved adobe buildings and living history demonstrations such as blacksmithing, offers insight into San Diego’s early Mexican-American history in the 1800s.

Hotel Del Coronado Tour & Lunch

WEDNESDAY, OCTOBER 9 / 9:30 A.M. - 2:30 P.M.
- Price: $75
- Meet at the Sheraton Marina Tower Lobby at 9:15 a.m.

Your visit to Coronado begins with a 90-minute tour of the iconic Hotel Del Coronado, which brings to life the resort’s rich heritage, local legends and most notorious phantom Kate Morgan. Discover all the stories and moments in history through this in-depth walking tour of the Victorian building and gardens, including an exclusive 90-minute behind-the-scenes look.

Following the tour, you will have time to visit the many shops at The Del, take a stroll along its sparkling sandy beach, dip your toes into the Pacific Ocean, or just sit and enjoy the relaxing atmosphere of this wonderful seaside resort. Afterwards, we will take a short stroll across the street for a light lunch at the Blue Water Grill, located over the water in the historic former Hotel Del Coronado Boathouse.

San Diego Safari Park

TUESDAY, OCTOBER 8 / 10 A.M. - 4:30 P.M.
- Price: $85
- Meet at the Sheraton Marina Tower Lobby at 9:45 a.m.

The renowned San Diego Zoo Safari Park presents more than 3,500 animals roaming in large enclosures that replicate their natural habitat. Your exciting safari experience includes seeing herds of rhinos, giraffes, antelope, and zebras roaming their natural habitats, as well as beautiful walking trails to see more exotic animals.

Experience a safari adventure unlike any other outside of Africa itself, with exhibits inspired by the African Serengeti and the Asian Savanna. You will have an opportunity to venture into Asia by cart with a knowledgeable guide, who will give you a deeper understanding of our animals and how they thrive in the park. This personalized tour offers an opportunity to see field enclosures not accessible to the public. You will have photo stops and a unique opportunity to watch Asian wildlife enjoy a tasty treat.
AMTA 2019
Short Course

5G Antenna Design, Applications and Measurement Techniques

SUNDAY, OCTOBER 6 / 7:30 A.M. - 5:30 P.M. / MARINA 6

This Short Course will be presented by 4 renowned speakers covering different 5G and IoT related topics with focus on design, applications and measurements. Phased array design for 5G applications will be presented by Gabriel Rebeiz. Aida L. Vera Lopez will present emerging antenna 5G standards and requirements currently being developed. David R. Novotny will discuss the use of smart antennas in the modeling of propagation channels at 5G frequencies and other measurement challenges associated with these new standards and requirements. Measurement techniques for 5G and IoT enabled devices in both far-field and near-field will be illustrated by Per O. Iversen. Breakfast, lunch and refreshment breaks are provided for all Short Course attendees.

INSTRUCTORS:

Gabriel Rebeiz
University of California San Diego

Prof. Rebeiz is member of the National Academy of Engineering (NAE), an IEEE Fellow, the IEEE MTT 2010 Distinguished Educator Award and the 2011 IEEE AP (Antennas and Propagation) John D. Kraus Antenna Award. He has been an Associate Editor of IEEE MTT, and a Distinguished Lecturer for IEEE MTT, IEEE AP, and IEEE Solid-State Circuits Societies. Prof. Rebeiz has mentored and supervised more than 100 graduate students and post-doctoral fellows and has more than 500 IEEE publications. He is the Director of the UCSD/DARPA Center on RF MEMS Reliability and Design Fundamentals, and the author of RF MEMS: Theory, Design and Technology, Wiley (2003).

David R. Novotny
National Institute of Standards and Technology

David Novotny graduated from the University of Colorado with a BS in Electrical Engineering in 1990. He later joined the National Institute of Standards and Technology’s Electromagnetics Division and completed an MS in EE at the University of Colorado. At NIST, he has worked on EMC facility evaluations using broadband synthetic time domain analysis. Since 2000, he has been working in Antenna Metrology, designing systems and methods for accurate measurements of antenna parameters. David is author or co-author of over 140 refereed journal and conference papers. He has earned numerous awards in his domain, particularly the Department of Commerce Bronze Medal for NIST’s work in a multi-agency Electromagnetic shielding analysis of the Space Shuttle Orbiter.

Per Iversen
Microwave Vision Group

Mr. Per O. Iversen is the CTO of MVG. Per earned his MSEE from the University of California, Los Angeles and his BSEE from California State University, Long Beach. Per began his career working on electromagnetic analysis and design for various satellite applications. Starting in 1991, for the European Space Research and Technology Center (ESTEC), Per managed antenna development programs for both terrestrial and space borne applications. In 1998, he incorporated SATIMO’s U.S. operations in Georgia, and became CEO of MVG-Orbit/FR, Inc. when they merged. Per has been a contributing member to various international standardization committees (CTIA, WiMax Forum, Wi-Fi Alliance). He is a Senior Member of AMTA and has served on its Board of Directors as Secretary and Vice President. He is a regular lecturer at UCLA, has co-authored numerous papers relating to multi-probe antenna measurement, and is currently involved in developing test systems for 5G and millimeter-wave antenna application.

Aida L. Vera Lopez
Intel Corporation

Dr. Aida Vera López is a wireless standards research engineer at Intel Corporation, focusing on 5G new radio RF topics, within the 3GPP Radio Access Network 4 (RAN4) working group. Before her involvement in standards, she participated in various groups at Intel within the Engineering Leadership Program. She received her BS in Electrical Engineering from the University of Puerto Rico, and her MS and Doctorate of Philosophy degrees in Electrical and Computer Engineering from the Georgia Institute of Technology. Her research background includes mm-wave antenna design, packaging integration and material characterization at high frequencies. Since 2014, Dr. López has served as Publications Co-Chair for the Radio & Wireless Week Conference (RWS).
The 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 an ideal training opportunity 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.

The AMTA Boot Camp Back-to-Basics Topics Include:
- General RF Measurements
- Material Measurements
- Antenna Measurements
- RCS Measurements
- EMC/EMI Measurements

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, etc.)

### COURSE OUTLINE & SCHEDULE

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Presenter</th>
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<tbody>
<tr>
<td>07:30 - 08:30 a.m.</td>
<td>Breakfast</td>
<td>Harbour Island 3</td>
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<tr>
<td>08:30 - 08:50 a.m.</td>
<td>Introduction</td>
<td>Lydell Frasch, The Boeing Company</td>
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<tr>
<td>08:50 - 09:30 a.m.</td>
<td>General RF Measurements</td>
<td>Alexander Knisely, AFLCMC</td>
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<tr>
<td>09:30 - 09:45 a.m.</td>
<td>General RF Measurements Demo</td>
<td>Alexander Knisely, AFLCMC</td>
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<tr>
<td>09:45 - 10:00 a.m.</td>
<td>Break</td>
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<tr>
<td>10:00 - 10:45 a.m.</td>
<td>Material Measurements</td>
<td>Michael Havrilla, AFIT</td>
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<tr>
<td>10:45 - 11:00 a.m.</td>
<td>Material Measurements Demo</td>
<td>Alexander Knisely, AFLCMC</td>
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<tr>
<td>11:00 - 11:15 a.m.</td>
<td>Break</td>
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<tr>
<td>11:15 - 12:15 a.m.</td>
<td>Antenna Measurements</td>
<td>Jeff Kemp, GTR</td>
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<td>12:15 - 12:30 p.m.</td>
<td>Antenna Measurements Demo</td>
<td>Jeff Kemp, GTR</td>
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<td>12:45 - 1:30 p.m.</td>
<td>Lunch</td>
<td>Harbour Island 3</td>
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<td>1:30 - 2:25 p.m.</td>
<td>RCS Measurements</td>
<td>Stephen Blalock, NSI-MI</td>
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<td>2:25 - 2:55 p.m.</td>
<td>RCS Measurements Demo</td>
<td>Stephen Blalock, NSI-MI</td>
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<td>2:55 - 3:10 p.m.</td>
<td>Break</td>
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<td>3:10 - 4:05 p.m.</td>
<td>EMC/EMI Measurements</td>
<td>Randy Jost, Ball Aerospace</td>
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<td>4:05 - 4:25 p.m.</td>
<td>EMC/EMI Measurements Demo</td>
<td>Randy Jost, Ball Aerospace</td>
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<td>4:25 - 4:45 p.m.</td>
<td>Conclusion</td>
<td>Lydell Frasch, The Boeing Company</td>
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Student Day

TUESDAY, OCTOBER 8 / 11:30 A.M. - 7:00 P.M. / SPINNAKER

• Sponsored by: STAR Dynamics
• Student Day Coordinator: Dr. Fillippo Capolino, UC Irvine

During AMTA’s Student Day, students will participate in presentations and discussions related to antenna measurement technology culminating in a design and measurement contest with prizes awarded to the winners. They will also have the opportunity to tour the vendor exhibit hall and view several technology demonstrations.

Guest Speakers

Dr. Brian Fischer
Principal Research Scientist at Resonant Sciences, Dayton OH


Signal processing in the Radar Cross Section (RCS) measurement world now benefits from all of the work in medical imaging and other fields utilizing what’s known as Compressive Sensing. Outdoor RCS measurements in particular must at times contend with intruders that fly through the measurement window at inopportune times. At a particular outdoor RCS range in New Mexico, bats became an issue and this initiated a need to remove them from data. Compressive Sensing via Basis Pursuit was the perfect solution. This talk will explain why.

Dr. Paolo Focardi
Senior RF Microwave Engineer at Jet Propulsion Laboratory, Pasadena, CA

Instrument Antennas for NASA’s Earth Science Projects

Low Earth Orbit (LEO) is a perfect vantage point to observe a variety of natural phenomena on a global scale. By carefully selecting an orbit around our planet and by properly designing an instrument antenna with adequate performance, it is possible to map the entire globe and get a new data point anywhere in the world every few days. Whether to observe ocean water salinity, soil moisture, wind speed or one of many other ever-changing aspects of our planet, NASA has developed, launched and operated a variety of spacecrafts with antennas capable of making amazing discoveries. This talk is focused on a few examples of such instrument antennas, with particular emphasis on the techniques used to design and develop them. Aquarius/SAC-D, SMAP, COWVR and NISAR are just a few examples of Earth Science Projects the speaker has been involved with and will be discussed in detail. The use of scale models in addition to computer models during the development phases of each project will also be discussed, along with the challenges encountered in performing RF measurements of antennas’ radiation patterns.

Schedule

<table>
<thead>
<tr>
<th>COURSE OUTLINE &amp; SCHEDULE</th>
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<tr>
<td>11:30 a.m. - 12:45 p.m.</td>
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<td>12:45 - 1:00 p.m.</td>
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<td>5:00 - 6:00 p.m.</td>
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<td>6:00 - 7:00 p.m.</td>
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Zoya Popovic received her Dipl. Ing. degree from the University of Belgrade, Serbia, in 1985, and the M.S. and Ph.D. degrees from Caltech, Pasadena, California, in 1986 and 1990, respectively. Her doctoral thesis was on large-scale quasi-optical microwave power combining. She joined the faculty of the University of Colorado in Boulder in August 1990, where she became a full professor in 1998, and received the Hudson Moore Jr. endowed professorship in 2006. She was named Distinguished Professor in 2010 and Lockheed Martin Endowed Chair in 2017. She has developed five undergraduate and graduate electromagnetics and microwave laboratory courses and co-authored (with her late father) Introductory Electromagnetics for the junior-level core course for electrical and computer engineering students, translated to several foreign languages. Her research interests include high-efficiency linear microwave power amplifiers, low-loss broadband microwave and millimeter-wave circuits, medical applications of microwaves, intelligent RF circuits, active antenna arrays, cryogenic circuits, microwave radiometry, and wireless powering for low-power sensors. She was a Visiting Professor at the Technische Universitat Muenchen, Munich, Germany, in 2001 and 2003, and at Supaero (ISAE), Toulouse, in 2014 and a Chair of Excellence at Carlos III University in Madrid, Spain, in 2018.

Multi-beam Phase-Shifterless Antenna Array and Free-space Measurements

This talk describes the analysis, design and measurements of steered and multi-beam phase-shifterless passive and active antenna arrays. Active arrays include receive, transmit and both full and half-duplex T/R arrays. Examples of arrays from 36 to 956 elements in size and from X to W-band will be given, with various applications, including LEO satellite down-links (8.36 GHz), formation-flying satellite links (28 GHz), multi-path mitigation (10 GHz) and angle-of-arrival detection (through W-band).
Over the past 20 years, electronically scanned probe arrays have clearly demonstrated their capability to drastically shorten the measurement time for testing antennas. This antenna measurement technique has been well accepted primarily in the civil telecommunication market. However, the advantages of using electronically scanned probe arrays has not only been a question of speeding up the measurement time. Hence, instead of using these measurement tools for one-shot measurements at the end of any new development, they have been increasingly used from the beginning to the end of development, therefore participating in optimizing all radiated parameters of the system. In the last few years, we have observed a strong interest in using probe arrays for Aerospace and Defense applications. This talk will introduce and discuss the challenges currently being faced regarding the use of probe arrays for testing Aerospace and Defense antennas.

Philippe Garreau is a graduate of SUPELEC, a historically prominent engineering school in France. He began his career at the European Space Agency (ESA) before joining SATIMO in 1992 as an engineer in charge of antenna measurements. He became Managing Director of SATIMO in 1996 and at the age of 46, became CEO of Microwave Vision Group in 2008. He has been the driving force behind the transformation of SATIMO from an independent research unit on the outskirts of Paris to its status as an international Group and a leading supplier of antenna measurement systems, EMC test facilities, and full turn-key test solutions for advancing wireless technology.

Jean-Charles Bolomey is currently Emeritus Professor at Paris-Saclay University (PSU), France. Graduating from Supelec in 1963, he obtained a Ph.D. from PSU in 1971, where he became Professor in 1976 and conducted his research in the Laboratoire des Signaux et Systèmes, a joint unit of PSU, Supelec and the National Center for Scientific Research.

Since 1981, his contributions, deliberately oriented toward innovative technology transfer and valorization, have been devoted to Near-Field and Very-Near-Field techniques in their broad acceptance, including antenna measurement, EMC testing as well as Industrial-Scientific-Medical (ISM) applications. He most particularly promotes the use of modulated probe array technology for rapid Near-Field characterization of intentional and non-intentional radiating systems. He co-authored with Professor F. Gardiol a reference book on “Engineering Applications of the Modulated Scatterer Technique” and is holder of numerous patents covering various probe array arrangements for microwave sensing and imaging systems, such as the first microwave camera for biomedical applications, awarded Best Paper at the 1983 European Microwave conference. In 1986, Professor Bolomey founded the Microwave Vision Company SATIMO while also involved in industrial applications of microwave heating and material processing, as well as in High Power Microwave metrology. His recent research targets rapid probe array SAR measurements and load-modulated scattering antennas with related RFID sensing applications, as visiting Professor at UPC Barcelona. He has contributed widely, as member of several Scientific Advisory Boards, to several European Institutions and startup companies.

Professor Bolomey has received several awards, including the Blondel Medal of the Société des Electriciens et des Electroniciens, the Général Ferré Award of the French Academy of Sciences, the Medal of the French URSI Chapter and the Schlumberger Stitching Fund Award for his contribution to inverse scattering techniques in microwave imaging. He has received the 2002 AMTA Distinguished Achievement Award for his pioneering activity in the field of modulated probe arrays, and was elected Edmund S. Gillespie Fellow in 2007. He is Fellow of the IEEE and was Distinguished Lecturer of the IEEE Antenna and Propagation Society from 2010 to 2013. He has received the 2015 Joseph F. Keithley Award from the IEEE Instrumentation and Measurement Society for his pioneering contributions to efficient probe array technology for fast electromagnetic near-field techniques and microwave imagery, and the 2017 Antenna Award of the European Association for Antennas and Propagation.
A scatterometer has been designed and fabricated to operate in the 50-750 GHz region of the spectrum. The scatterometer is currently undergoing final installation at ESTEC and during integration and test further research was required to address three factors which were limiting performance: anomalous phase shift, coupling variation, standing waves and lack of normalization of the measured signal. This paper will present the design and describe how these issues were resolved using experimental and simulated data. Finally, the uncertainty evaluation of the measurements will be presented.

The scatterometer is being used to improve the measurement of reflection, transmission and absorption. This is sufficient in the case of homogeneous materials with perfectly flat and smooth interfaces. When the material is inhomogeneous or rough, however, some of the incoming radiation will be scattered away. To measure this scattering and therefore improve the measurement of reflection, transmission and absorption a scatterometer has been designed and fabricated to operate in the 50-750 GHz region of the spectrum.

The scatterometer is currently undergoing final installation at ESTEC and during integration and test further research was required to address three factors which were limiting performance: anomalous phase shift, coupling variation, standing waves and lack of normalization of the measured signal. This paper will present the design and describe how these issues were resolved using experimental and simulated data. Finally, the uncertainty evaluation of the measurements will be presented.

Elena Saenz was born in Viana, Navarra, Spain, in 1981. She received the M.Sc. and Ph.D. degrees from the Public University of Navarra (UPNA), Pamplona, Spain, in 2004 and 2008, respectively, both in Telecommunication Engineering. Her doctoral research was focused on the analysis and design of meta-surfaces with emphasis on their application as superstrates for planar antennas.

Until 2008 she was with the Antenna Group, Public University of Navarra. Since then, she has been working at the European Space Research and Technology Centre (ESTEC), European Space Agency (ESA), Noordwijk, The Netherlands with main interest in frequency/polarization selective surfaces, (sub)millimetre wave technologies and applications, antenna measurements and material characterization.

Dr. Saenz received the Loughborough Antennas and Propagation Conference (LAPC) 2006 and 2007 Best Paper Awards and the International Workshop on Antenna Technology (IWAT) 2007 Best Paper Award. In 2008, she received the IEEE Antennas and Propagation Society Graduate Research Award. She was co-author of the best paper in measurements at EuCAP 2018.

Daniel Sievenpiper joined the UC San Diego faculty in 2010. He received his BS in 1994 and his PhD in 1999 from UCLA, where he studied photonic crystals and other periodic structures, and invented the high impedance electromagnetic surface. Dan joined HRL (the former Hughes Research Laboratories) in Malibu, CA in 1999. During the following 11 years, he and his team developed new electromagnetic structures, with an emphasis on small, conformal, tunable, and steerable antennas. Dan held a variety of technical and management positions at HRL including Director of the Applied Electromagnetics Laboratory. In 2010 he joined UC San Diego, where his research is focused on artificial media, and the integration of active electronics with electromagnetic structures and antennas to enable new capabilities and applications. In 2008, Dan received the URSI Issac Koga Gold Medal. In 2009, he was named as a Fellow of the IEEE. Dan currently has more than 70 issued patents and more than 140 technical publications.
The Honorary Life Membership Award is presented to Dr. Eric Walton, who throughout his career has exemplified and promoted the goals and objectives of the ANTENNA MEASUREMENT TECHNIQUES ASSOCIATION.

The AMTA hereby cites Eric Walton for:

- Chairing the Student Paper Committee every year from 2006 to 2018
- Initiating and chairing the Student Scholarship Committee from 2012 to 2018
- Actively encouraging students to participate in AMTA and mentoring them to pursue careers in electromagnetics
- Contributions as a Session Chair, Member of the Technical Program Committee, and numerous paper submissions
- Service on the Antenna Measurement Techniques Association Board of Directors, including two terms as Vice Chairman and one term as AMTA President
- Contributions in supporting symposia preparation, including serving as the Host for the AMTA 1992 Symposium and as a member of the 2013 Host Committee
- His many ongoing years of AMTA support

For the many years of leadership and dedication to AMTA
The 2019 AMTA Distinguished Achievement Award is presented to Dr. Brian E. Fischer, who throughout his career has exemplified and promoted the goals and objectives of the ANTENNA MEASUREMENT TECHNIQUES ASSOCIATION.

The AMTA hereby cites Dr. Brian E. Fischer for:

- Contributions to the RCS measurement metrology, antenna and algorithm design for direction finding, and radar processing
- Test and analysis related to national RCS range measurement and Low Observable (LO) flightline maintenance of stealth air vehicles
- Contributions in the application of algorithmic solutions to near-field measurement problems for practical air vehicle diagnostics
- Service as the lead architect of the Signature Analysis, Basis Editing and Reconstruction (SABER) RCS data analysis software tool Awarded U.S. Patent #6417795 in 2001 related to shape optimization for RCS
- Contributions as author or co-author of over 30 papers and presentations at international conferences and high-level DoD symposia
- Contributions through service on the Antenna Measurement Techniques Association Board of Directors, from 2009-2013, serving in the positions of Technical Coordinator, President and Past President
- His many ongoing years of AMTA support

For outstanding and pioneering contributions to the practice of antenna design, analysis, and measurements
The 2019 AMTA Distinguished Service Award is presented to John Estrada for his outstanding service to the ANTENNA MEASUREMENT TECHNIQUES ASSOCIATION.

The AMTA hereby cites John Estrada for:

- Service as host of the AMTA 2010 Symposium in Atlanta
- Contributions to the Technical Program Committee as review and session Chair at numerous AMTA symposia
- Contributions through service Antenna Measurement Techniques Association Board of Directors, including Meeting Coordinator in 2014 and 2015, and Vice President in 2016
- Leading efforts to establish a MOU between the AMTA and IEEE AP-S
- Service on the Regional Event committees from 2014 – 2017 to help implement the Regional Event programs in respective locales
- Contributions as Chairman of the Web Oversight Committee
- Service as Treasurer on the AMTA 2018 Host Committee
- His many years of ongoing AMTA support

For outstanding contributions to AMTA in numerous areas of service
Dr. C.J. Reddy

Dr. C.J. Reddy is the Vice President, Business Development-Electromagnetics for Americas at Altair Engineering, Inc. At Altair, he is leading the marketing and support of commercial 3D electromagnetic software, Feko in the Americas. Dr. Reddy was a research fellow at the Natural Sciences and Engineering Research Council (NSERC) of Canada and was awarded the US National Research Council (NRC) Resident Research Associateship at NASA Langley Research Center. While conducting research at NASA Langley, he developed various computational codes for electromagnetics and received a Certificate of Recognition from NASA for development of a hybrid Finite Element Method/Method of Moments/Geometrical Theory of Diffraction code for cavity backed aperture antenna analysis. Dr. Reddy is a Fellow of IEEE, fellow of ACES, and a Senior Member of AMTA, and served on the ACES Board of Directors for 11 years. Dr. Reddy was awarded the Distinguished Alumni Professional Achievement Award by his alma mater, the National Institute of Technology (NIT), Warangal in 2015. He has published 37 journal papers, 77 conference papers and 100 technical reports. He was the recipient of a 1995 U.S. Fulbright Research Award, the 2001 AEG Elektron Foundation’s Award, the 2003 DTU Student Union’s Teacher of the Year Award, and the 2013 and 2015 European School of Antenna Best Teacher Awards. Dr. Breinbjerg is an AMTA Senior Member and IEEE Fellow.

Dr. Olav Breinbjerg

Olav Breinbjerg received the Ph.D. degree in Electrical Engineering from the Technical University of Denmark (DTU) in 1992. He has since been on the Faculty of the Department of Electrical Engineering where he is now Full Professor and Head of the Electromagnetic Systems Group and the DTU-ESA Spherical Near-Field Antenna Test Facility. His research is in applied electromagnetics - antennas, antenna measurements, computational techniques, and scattering - for applications in wireless communication and sensing. He has been, or is, the main supervisor of 14 Ph.D. projects, and author or co-author of more than 65 journal papers, 175 conference papers, and 100 technical reports. He was the recipient of a Hybrid Finite Element Method/Method of Moments/Geometrical Theory of Diffraction code for cavity backed aperture antenna analysis. Dr. Reddy is a Fellow of IEEE, fellow of ACES, and a Senior Member of AMTA, and served on the ACES Board of Directors for 11 years. Dr. Reddy was awarded the Distinguished Alumni Professional Achievement Award by his alma mater, the National Institute of Technology (NIT), Warangal in 2015. He has published 37 journal papers, 77 conference papers and 18 NASA Technical Reports to date. Dr. Reddy is a co-author of “Antenna Analysis and Design Using FEKO Electromagnetic Simulation Software,” published in 2014. Dr. Reddy was General Chair of the ACES 2011, 2013, and 2015 Conferences. He was the Co-General Chair of the 2014 IEEE AP-S/USNC-URSI, and most recently, General Chair for the AMTA 2018 Conference in Williamsburg, Virginia.

Dr. Manuel Sierra-Castañer

Dr. Manuel Sierra-Castañer was born in Zaragoza (Spain). He obtained his Telecommunication Engineering degree in 1994 and PhD in 2000, both from the Universidad Politécnica de Madrid (UPM). He worked for Airtel from 1995 to 1997. In 1997, his academic work began at the University “Alfonso X”. In 1998 he transferred his skills to UPM moving up from research assistant to Full Professor by 2017. He has been director of several research projects, has published 40 papers in scientific journals, and has directed 8 PhD Theses. He was visiting researcher at Tokyo Tech and EPFL during his PhD, and visiting Professor at Tokyo Tech in 2012 and 2013. Currently, he is Senior Member of the IEEE and AMTA Societies. His current research interests are in planar antennas and antenna measurement systems. Dr. Sierra-Castañer obtained the IEEE AP-S 2007 Schelkunoff Prize Paper Award for “Dual-Polarization Dual-Coverage Reflect Array for Space Applications” in 2007. Dr. Sierra-Castañer was head of the EurAAP WG5 “Measurements” from April 2012 to 2015, and represents UPM on the Board of ESaO. In 2015, he became the AMTA Europe Liaison, and in 2016, joined the EurAAP Board of Directors. Since 2019, he is EurAAP Vice-Chair.

AMTA 2019 Fellows

AMTA 2019 Senior Members

- Dr. Jin-Seob Kang  
  Korean Institute of Science and Standards (KRISS)

- Dr. Satoru Kurokawa  
  National Institute of Advanced Industrial Science and Technology (AIST)

AMTA 2019 Outstanding Service Awards

- Dave Pinnell  
  2015 Treasurer, 2016 Treasurer, 2017 President, 2018 Past President

- Mike Havrilla  
  2016 Secretary, 2017 Secretary, 2018 Vice President

- C.J. Reddy  
  2018 Host

- Microwave Vision Group (MVG)  
  2019 Host Organization

- San Diego State University  
  2019 Co-Host Organization

AMTA 2019 Student Travel Scholarship Winners

- Doctoral Travel Scholarship  
  Ms. Anna Polaczek  
  RWTH Aachen University

- Master’s Travel Scholarship  
  Ms. Carmen del P. Matos Berrios  
  Ohio State University

- Undergraduate Travel Scholarship  
  Mr. Dane Fairchild  
  San Diego State University
8:00 A.M. - 9:06 A.M.
Meeting Opening/Keynote Address

- Welcome and Introduction of Keynote Speaker: Donnie Gray (AMTA President)

Keynote Address
Dr. Zoya Popovic
Distinguished Professor, University of Colorado; Lockheed Martin Corporation Endowed Chair of Radio Frequency Engineering.
“Multi-beam Phase-Shifterless Antenna Arrays and Free-Space Measurements”

- Opening Remarks and Technical Session Overview: Jeffrey Bean (Technical Coordinator)

Session 1
9:06 A.M. - 10:00 A.M.
Near-field Measurement Techniques
Chair: Justin Dobbins
Raytheon

- “Improvements in the Measurement of Very Low Cross Polarization Using the Three - Antenna Polarization Measurement Technique”, Allen Newell1, Paul Vizcaino2, David Gentle3 (1Newell Near-Field Consultants, 2Ball Aerospace and Technologies Corp., 3National Physical Laboratory)

- “Experimental Validation of Minimum Redundancy Scanning Schemes in PNF Measurements at V band”, Maria Saporetti1, Francesco D’Agostino2, Flaminio Ferrara2, Rocco Guerrero2, Claudio Gennarelli2, Damiano Trenta2, Francesco Saccardi1, Lars Foged1 (“Microwave Vision Italy SRL, 2D.I.In. - Università di Salerno, 3European Space Agency, ESTEC, The Netherlands”)

- “Practical Considerations in Compressed Spherical Near-Field Measurements”, Cosme Culotta-López1, Brett Walkenhorst1, Quang Ton2, Dirk Heberling1,3 (1RWTH Aachen University, 2NSI-MI Technologies, 3Fraunhofer Institute for High Frequency Physics and Radar Techniques)

MONDAY October 7, 2019

10:00 A.M. - 10:30 A.M. > MORNING BREAK
Sponsored by VDI (Booth 205)

Session 2
10:30 A.M. - 11:24 A.M.
Imaging, Algorithms, and Processing
Chair: Manuel Sierra-Castañer
Universidad Politécnica de Madrid

- “Comparative Investigation of Spatial Filtering Techniques for Ground Plane Removal in PEC-Based Automotive Measurements”, Francesco Saccardi1, Francesca Mioc1, John Estrada2, Per Iversen1, Lars Foged1, Michael Edgerton1, Janalee Graham1 (1Microwave Vision Italy SRL, 2MVG, Inc, 3Orbit/FR’s Corporate HQ, 4GM Milford Proving Ground, 5GM Technical Fellow Antenna Development and Performance (Retired))

- “Validation of Electromagnetic Compatibility Chambers with a Spherical Wave Expansion Approach”, Cosme Culotta-López, Zhong Chen, Thomas Gemmer, Dirk Heberling1,3 (1RWTH Aachen University, 2ETS-Lindgren, 3Fraunhofer Institute for High Frequency Physics and Radar Techniques)

- “Measuring and Processing Near-Field Data on Non-Standard Grids at the National Institute of Standards and Technology”, David Novotny, Ronald Wittmann, Michael Francis (1National Institute of Standards and Technology, 2Strativia LLC)

11:30 A.M. - 1:30 P.M. > EXHIBITOR’S LUNCH – EXHIBIT AREA
Sponsored by our exhibitors

Session 3
1:30 P.M. - 3:00 P.M.
Antenna Design and Analysis
Chair: Brett T. Walkenhorst
NSI-MI Technologies

- “Experimental Verification of 3D Metal Printed Dual Circular-Polarized Horn Antenna for V-band Millimeter-Wave Applications”, Ningning Luo2, Xinhua Yu, Ghanshyam Mishra1, Satish Sharma1 (1San Diego State University, 2Gulim University of Electronic Technology)
**Session 4**

**Session 5**

**Session 6**
Session 7

1:30 P.M. - 3:00 P.M.

Antenna Measurements
Chair: Stephen Blalock
NSI-MI Technologies

- "Comparative Testing of Devices in a Spherical Near field System and Plane Wave Generator", Lars Foged1, Francesco Scattone1, Darko Sekuljica1, Andrea Giacomini1, Francesco Saccardi1, Alessandro Scannavini1, Per Iversen2, Nicolas Gross3, Evgueni Kaverine3 (*Microwave Vision Group, 1Orbit/FR, 2MVG, Microwave Vision HQ)

- "Impact of Sparse Measurements in Freehand Setup for Antenna Characterization", Guillermo Alvarez-Narciandi, Jaime Laviada, Yuri Alvarez-Lopez, Fernando Las-Heras (University of Oviedo)

- "De-embedding Raddome Depolarization from Measurements with a Non-Ideal Circularly Polarized Antenna Source", Joshua Roper, Matthew Miller, Don Runyon (Viasat, Inc.)

- "A Methodology for Instantaneous Polarization Measurements Using a Calibrated Dual-Polarized Probe", Brett Walkenhorst, Steve Nichols (NSI-MI Technologies)

- "Comparison of Antenna Measurements Obtained Using an Electro-Optical Probe System to Conventional RF Methods", William Dykeman, Brian Canterbury (Raytheon Company)

3:00 P.M. - 3:30 P.M.  > AFTERNOON BREAK

Sponsored by AMTA 2020 (Booth 209)
8:00 A.M. - 8:30 A.M.
Invited EurAAP Speaker
Dr. Elena Saenz
European Space Agency (ESA/ESTEC)
“A Scatterometer Operating at Millimetre and Sub-Millimetre Wave Wavelengths: Design, Integration and Testing”

8:30 A.M. - 8:36 A.M.
Daily Announcements and Technical Session Overview
Jeffrey Bean (Technical Coordinator)

Session 9
8:36 A.M. - 9:30 A.M.
Radar Cross Section Measurements and Processing
Chair: Jin-Seob Kang
Korea Research Institute of Standards and Science

- "Measurements of Non-Metallic Targets for the Austin RCS Benchmark Suite", Jon Kelley1, David Chamulak2, Clifton Courtney2, Ali Yilmaz1 (The University of Texas at Austin, Lockheed Martin Aeronautics Company)
- "Measurements on Extended Objects for Radar Field Probes", Pax Wei (Independent Consultant)

9:30 A.M. - 10:00 A.M.  > MORNING BREAK
Sponsored by Quarterbranch Technologies (Booth 411)

Session 10
10:00 A.M. - 11:30 A.M.
Spherical Near-field Measurements
Chair: Teh-Hong Lee
The Ohio State University

- "Spherical Near-Field Measurements of Satellite Antennas at Extreme Temperatures", Andrea Giacomini1, Andrea Martellosio1, Vincenzo Schirotti1, Lars Foged1, Marco Castellani1, Fabrizio Rinalducci2, Diego Cardoni2, Alessandro Maraca2, Christian Feat2, Sylvain Leroy2, Frédéric Viguier3, Jérôme Sinigaglia, Luis Rolo1 (Microwave Vision Italy s.r.l., 2Angelanti Test Technologies s.r.l., 3Thales Alenia Space France, 1ESA-ESTEC)
- "Influence of the Phase Uncertainty in Spherical Wave Expansion in the Millimeter-Wave Range", Anna Polaczek1, Thomas Gemmer1, Dirk Heberling1,2 (RWTH Aachen University, Fraunhofer Institute for High Frequency Physics and Radar Techniques FHR)
- "Combination of Spherical and Planar Scanning for Phaseless Near-Field Antenna Measurements", Fernando Rodriguez-Varela1, Belén Galocha-Iragüén1, Manuel Sierra-Castañer1, Javier Fernández-Alvarez2, Michel Mattes1, Olav Breinbjerg1 (Universidad Politécnica de Madrid, 2Technical University of Denmark)
- "Fast Spherical Near-Field Measurements on Arbitrary Surfaces by Application of Pointwise Probe Correction to Compressed Sampling Schemes", Cosme Culotta-López1, Dirk Heberling1,2 (RWTH Aachen University, Fraunhofer Institute for High Frequency Physics and Radar Techniques)
- "Accurate Calibration of Truncated Spherical Near Field Systems with Different Ground Floors using the Substitution Technique", Francesco Saccardi1, Francesca Mioc1, Andrea Giacomini1, Alessandro Scannavini1, John Estrada2, Per Iversen2, Lars Foged1, Michael Edgerton1, Janalee Graham5 (Microwave Vision Italy SRL, MVG Inc, Orbit/FR’s Corporate HQ, GM Milford Proving Ground, 5GM Technical Fellow Antenna Development and Performance (Retired))

12:00 P.M. - 1:30 P.M.  > LUNCH
Lunch & Learn
Dr. Daniel Sievenpiper
Professor, University of California San Diego

“Patterned Metasurfaces for Manipulating Propagation, Scattering, and Interaction of Waves with Objects and Materials”
Session II

1:30 P.M. - 3:00 P.M.

Robotic Measurement Systems
Chair: Luis Rolo
European Space Agency

- “A Robotic Near-Field Antenna Test System Relying on Non-Canonical Transformation Techniques”, Daniel Janse van Rensburg, Brett Walkenhorst, Quang Ton, John Demas (NSI-MI Technologies)

- “A Low-Cost Multicopter Based Near-Field Antenna Measurement System Employing Software Defined Radio and 6-D Laser Metrology”, Raimund Mauermayer¹, Jonas Kornprobst², Torsten Fritz¹³ (¹Independent Researcher, ²Department of Electrical and Computer Engineering, Technical University of Munich, ³Aeroxess UG Company)

- “A Compact Reconfigurable Millimeter-Wave Antenna Measurement System Based Upon an Industrial Robot”, Jason Jerauld, Felix Yuen, Nathan Landy, Tom Driscoll (Echodyne Corporation)

- “Robotically Controlled Pattern Measurements of 60 GHz Phased Array Antenna”, Carmen Matos, Jiantong Li, Nima Ghalechelchian (ElectroScience Laboratory, The Ohio State University)

- “Active Array Measurements using the Portable Laser Guided Robotic Metrology System”, Marie Piasecki¹, Peter Slater¹, James Downey¹, Bryan Schoenholz¹, Kevin Lambert¹ (¹NASA Glenn Research Center, ²Vantage Partners, LLC)

3:00 P.M. - 3:30 P.M.  > AFTERNOON BREAK

Sponsored by NPM (Booth 310)

Session 12

3:30 P.M. - 5:00 P.M.

Poster Session II
Chair: Francesco Saccardi
Microwave Vision Group

- “A Bandpass Filter Using Edge Coupled and Direct Coupled Techniques”, Anthony Ani, Ezekiel Nwobi, Eugene Obodo (University of Greenwich)

- “Personal Near-Field System 1987, Radio Camera 2019”, Dan Slater (Independent Consultant)

- “Recent Developments in International Facility Comparison Campaigns”, Maria Saparetti¹, Lars Foged¹, Cosme Cullota-Lopez², Antonis Alexandridis³, Bengt Svensson⁴, Yuri Alvarez-Lopez⁵, Félix Tercero³, Manuel Castañer⁶ (¹Microwave Vision Italy, ²RWTH Aachen University, ³Institute of Informatics & Telecommunications, ⁴Saab AB, ⁵Area de Teoría de la Señal y Comunicaciones, ⁶Yebes Observatory, ⁷ETSI Telecomunicación,Un. Politécnica de Madrid)

- “Adding Phase to the Rotating-Source Antenna Polarization Measurement Method”, Jerome Massiot (Mobile Mark Inc.)

- “Element Failure Detection of Array Antenna using Near-field Measurement with Shallow Neural Network”, Michitaka Ameya, Satoru Kurokawa (The National Institute of Advanced Industrial Science and Technology (AIST))

- “Automotive MIMO Antenna Imbalance Impact to Performance”, Leo Lanctot, Tola Jonah (Ford Motor Company)


- “Comparison and Contrast of the Antenna Calibration Methods of ANSI and CISPR”, Doug Kramer (ETS-Lindgren Inc.)

THURSDAY
October 10, 2019

8:00 A.M. - 8:30 A.M.

Invited IEEE AP-S Speaker
Dr. Jean-Charles Bolomey
Emeritus Professor, Paris-Saclay University

“Overview of Microwave-Based Imaging Systems for Medical Applications”

Session 13

8:30 A.M. - 9:30 A.M.

Standards and Characterization
Chair: Brian Fischer
Resonant Sciences

- “Standard Definitions of Terms for Antennas & Radio Wave Propagation”, Vikass Monebhurrun (CentraleSupelec)

- “Recent Changes to the IEEE Std 1502 Recommended Practice for Radar Cross-Section Test Procedures”, Eric Mokole¹, Vince Rodrigues², Jeff Fordham², L. J. Foged², Vikass Monebhurrun¹ (¹The MITRE Corporation, ²NSI-MI Technologies, ³Microwave Vision Group, ⁴CentraleSupelec)

- “A Review of the Changes and Additions to the Antenna Measurement Standard IEEE Std 149”, Vince Rodríguez¹, Lars Foged², Jeff Fordham¹ (¹NSI-MI Technologies, ²Microwave Vision Italy)
Session 14

10:00 A.M. - 11:30 A.M.
Material Measurements and Characterization
Chair: Lydell Frasch
The Boeing Company

- "Measurement of RF Absorber at Large Angles of Incidence using Spectral Domain Transformations", Brett Walkenhorst1, Vince Rodriguez1, Jorgen Bruun2 (NSI-MI Technologies, PPG Aerospace)

- "GSS (Gated-Short-Short) Calibration for Free-space Material Measurements in millimeter-wave Frequency Bands", Jin-Seob Kang, Jeong-Hwan Kim (Korea Research Institute of Standards and Science (KRISS))

- "Extraction of Magnetodielectric Properties from Metal-Backed Free-Space Reflectivity", Ren Geryak, John Schultz (Compass Technology Group)

- "Feasibility of Coaxial Resonators for Permittivity Measurements of Pressurized Gases", Jose Alvarez (Aramco Services Company: Aramco Research Center -- Houston)

- "Reduced Aperture Flanged Rectangular Waveguide Probe for Measurement of Conductor Backed Uniaxial Materials", Adam Brooks, Michael Havrilla (Air Force Institute of Technology)

11:30 A.M. - 1:30 P.M. > LUNCH

Session 15

1:30 P.M. - 3:00 P.M.
Measurement System Design and Methods
Chair: Zhong Chen
ETS-Lindgren

- "Enabling Large Antenna Scan Areas via Positional Data Stitching", Bryan Schoenholz, James Downey, Marie Piasecki, Peter Slater (NASA Glenn Research Center)

- "A Straightforward Dynamic Range Error Analysis", Marion Baggett, Brett Walkenhorst (NSI-MI Technologies)

- "EMC Measurement System Based on Software Defined Radio and Post-Processing Techniques", Ruben Tena Sanchez1, Lars Foged1, Donald Gray2, Manuel Sierra Castaner1 (Universidad Politécnica de Madrid, Microwave Vision Group)

- "CATR Quiet Zone Depth Variation", Marion Baggett, Brett Walkenhorst (NSI-MI Technologies)

- "Small Antenna Testing in a Compact Antenna Test Range", Stuart Gregson1,2, Clive Parini2, Sergiy Pivnenko3 (Next Phase Measurements, Queen Mary University of London, Antenna Systems Solutions)
An important part of the AMTA Annual Meeting and Symposium each year is the outstanding group of exhibitors that participate in several different ways. The exhibitors set up, display, and demonstrate their latest equipment, often with hands-on opportunities for our members. Exhibitor personnel also author and present technical papers related to their expertise. Many of our exhibitors sponsor symposium events, including the exhibitor luncheon where complimentary hors d’oeuvres and foods are served throughout the exhibit areas for attending members. The AMTA 2019 list of exhibitors and sponsors are as follows:

<table>
<thead>
<tr>
<th>EXHIBITOR</th>
<th>WEBSITE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Test Equipment Rentals</td>
<td><a href="https://www.atecorp.com/">https://www.atecorp.com/</a></td>
<td>212</td>
</tr>
<tr>
<td>Altair</td>
<td><a href="https://www.altair.com/">https://www.altair.com/</a></td>
<td>407</td>
</tr>
<tr>
<td>Anechoic Solutions, Inc.</td>
<td><a href="https://www.anechoicsolutions.com/">https://www.anechoicsolutions.com/</a></td>
<td>304</td>
</tr>
<tr>
<td>AP Americas</td>
<td><a href="http://www.apamericas.com/">http://www.apamericas.com/</a></td>
<td>313</td>
</tr>
<tr>
<td>Chamber Services, Inc.</td>
<td><a href="http://www.chamberservicesinc.com/">http://www.chamberservicesinc.com/</a></td>
<td>308</td>
</tr>
<tr>
<td>CompuQuest, inc</td>
<td><a href="http://www.ecompuquest.com/">http://www.ecompuquest.com/</a></td>
<td>104</td>
</tr>
<tr>
<td>Delta Sigma Company</td>
<td><a href="https://www.deltasigmacompany.com/">https://www.deltasigmacompany.com/</a></td>
<td>113</td>
</tr>
<tr>
<td>Empower RF</td>
<td><a href="https://www.empowerrf.com">https://www.empowerrf.com</a></td>
<td>111</td>
</tr>
<tr>
<td>ETS-Lindgren</td>
<td><a href="http://www.ets-lindgren.com">http://www.ets-lindgren.com</a></td>
<td>401</td>
</tr>
<tr>
<td>EuCAP 2020</td>
<td><a href="https://www.eu-cap.org/">https://www.eu-cap.org/</a></td>
<td>110</td>
</tr>
<tr>
<td>Impulse Technologies / RFspin</td>
<td><a href="https://www.impulse-tech.com/">https://www.impulse-tech.com/</a></td>
<td>408</td>
</tr>
<tr>
<td>In Compliance Magazine</td>
<td><a href="https://incompliance.com">https://incompliance.com</a></td>
<td>211</td>
</tr>
<tr>
<td>Keysight</td>
<td><a href="https://www.keysight.com">https://www.keysight.com</a></td>
<td>210</td>
</tr>
<tr>
<td>Microwave Journal</td>
<td><a href="https://www.microwavejournal.com/">https://www.microwavejournal.com/</a></td>
<td>107</td>
</tr>
<tr>
<td>Microwave Product Digest</td>
<td><a href="https://www.mpdigest.com/">https://www.mpdigest.com/</a></td>
<td>Grande Foyer</td>
</tr>
<tr>
<td>Microwave Vision Group (MVG)</td>
<td><a href="https://www.mvg-world.com/">https://www.mvg-world.com/</a></td>
<td>103</td>
</tr>
<tr>
<td>Next Phase Measurements (NPM)</td>
<td><a href="http://nextphasmearurements.com/">http://nextphasmearurements.com/</a></td>
<td>310</td>
</tr>
<tr>
<td>NSI-MI Technologies</td>
<td><a href="https://www.nsi-mi.com/">https://www.nsi-mi.com/</a></td>
<td>303</td>
</tr>
<tr>
<td>Planar Monolithics Industries (PMI)</td>
<td><a href="https://www.pmi-rf.com/">https://www.pmi-rf.com/</a></td>
<td>213</td>
</tr>
<tr>
<td>PPG Cuming Microwave</td>
<td><a href="http://corporate.ppg.com/Home.aspx">http://corporate.ppg.com/Home.aspx</a></td>
<td>309</td>
</tr>
<tr>
<td>Quarterwave</td>
<td><a href="http://quarterwave.com/">http://quarterwave.com/</a></td>
<td>410</td>
</tr>
<tr>
<td>Raymond EMC</td>
<td><a href="http://www.raymondemc.ca/">http://www.raymondemc.ca/</a></td>
<td>206</td>
</tr>
<tr>
<td>Resonant Sciences</td>
<td><a href="http://www.resonantsciences.com/">http://www.resonantsciences.com/</a></td>
<td>409</td>
</tr>
<tr>
<td>Rohde &amp; Schwarz</td>
<td><a href="https://www.rohde-schwarz.com/us/home_48230.html">https://www.rohde-schwarz.com/us/home_48230.html</a></td>
<td>207</td>
</tr>
<tr>
<td>Sprinkler Innovations</td>
<td><a href="https://www.sprinklerinnovations.com/">https://www.sprinklerinnovations.com/</a></td>
<td>100</td>
</tr>
<tr>
<td>STAR Dynamics</td>
<td><a href="http://www.stardynamics.com/">http://www.stardynamics.com/</a></td>
<td>203</td>
</tr>
<tr>
<td>TDK RF Solutions</td>
<td><a href="https://tdksolutions.com/">https://tdksolutions.com/</a></td>
<td>208</td>
</tr>
<tr>
<td>WavePro</td>
<td><a href="http://www.wavepro.com.tw/">http://www.wavepro.com.tw/</a></td>
<td>106</td>
</tr>
</tbody>
</table>
Altair is a leading provider of enterprise-class engineering software enabling innovation, reduced development times, and lower costs through the entire product lifecycle from concept design to in-service operation. Our simulation-driven approach to innovation is powered by our integrated suite of software which optimizes design performance across multiple disciplines encompassing structures, motion, fluids, thermal management, electromagnetics, system modeling and embedded systems, while also providing data analytics and true-to-life visualization and rendering.  

Booth 407

AIST, one of the largest public research organizations in Japan, focuses on the creation and practical realization of technologies useful to Japanese industry and society. Electromagnetic Fields Standards Group of AIST is focused on antenna property measurement using RoF (Radio over fiber) technologies and mobile robot up to 325 GHz.  

Booth 108

Anechoic Solutions, Inc. offers all realms of design, fabrication, installation and testing solutions for your new, repurposed or relocated chamber needs. We are a second-generation company with over 40 years’ experience in this industry with resources from around the world to provide you with the absolute best solutions per your chamber requirements. We are a small, minority, woman owned business.  

Booth 304

Rohde and Schwarz is proud to host the 42nd Annual AMTA 2020 Symposium on November 1-6 in beautiful Newport, Rhode Island. Our venue for the 2020 AMTA Symposium is Gurney’s Resort, situated on Goat Island. This waterfront resort is centrally located to the area’s abundant attractions and activities, which include landmark mansions, museums, vineyards, golf courses, beaches, state parks, scenic walks, and cruises.  

The AMTA annual symposium is the premier conference dedicated to the field of antenna, RCS and other related measurements. Plan to attend AMTA 2020 to keep up on the latest industry trends, developments, and product offerings!  

Booth 209

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.  

Booth 313

Advanced Test Equipment Rentals (ATEC) is the global leader for EMC test instrument rentals, including EMC antennas, RF power amplifiers, and EMI receivers. ATEC offers short-term and long-term rentals for products from premier manufacturers like Advanced Amplifiers, Empower Amplifier Research, IFI, Rohde & Schwarz, Keysight, Teseq, Haefely and more. Since its inception in 1981, ATEC has dedicated itself to the rental experience by offering customers affordable rental rates, meeting their deadlines with immediate shipping and helping them navigate MIL, ISO, IEC and DO-160 standards.  

Booth 212

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 Characterization, 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.  

Booth 306
<table>
<thead>
<tr>
<th>Chamber Services Inc</th>
<th>CompuQuest, Inc</th>
<th>Delta Sigma Company</th>
<th>ETS-Lindgren</th>
<th>Empower RF Systems</th>
<th>Impulse Technologies / RFspin</th>
</tr>
</thead>
<tbody>
<tr>
<td>is a forward-thinking Anechoic Facility Design, Construction and Services Company committed to delivering the highest level of service and superior quality products to our valued customers. Our services include Anechoic Chamber Design, consultation and construction. Including Architectural, Modular and Welded RF Shielded Enclosure Installations, Relocations, Maintenance, RF Absorber Material Removal/Installation, RCM and Pneumatic RF Shielded Door Installation and maintenance, Zinc and Copper Coatings Flame Spray Service. Chamber Services Inc association with the leading RF Shielding and RF Absorber manufactures provides a factory direct source for RF Shielded Enclosures, RF Shielded Doors, RF Absorber materials, Power and Signal Line Filter, Waveguides, Pipe Penetrations, Custom Test Fixtures, Portable RF Absorber Panels and much more. Booth 308</td>
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<td>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. CompuQuest works closely with many radar manufacturers, including ECS Federal, Quarterbranch and MI Technologies, to add unparalleled realtime capabilities to the industry's top radar systems. This product base, and extensive hardware and software backgrounds, makes CompuQuest uniquely qualified to handle the needs of the measurement community. Booth 104</td>
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<td>began operations in January of 1990. We have almost 100 man-years of experience in-house for all kinds of specialized low observables testing. DSC designs and builds radar antennas, calibration targets, specialized data collection &amp; processing software, low RCS pylons, pylon elevators, pylon tilting mechanisms, multi-axis target positioners, low RCS target fixtures, foam columns, single-axis positioners, and motion controls for moving parts in/on the positioning system. DSC also builds automated systems for aircraft production lines. DSC's has significant expertise in building in-process RCS test systems for aircraft production lines, integrating the production world with the RCS testing world. Booth 113</td>
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<td>offers innovative EMC, Wireless, RF and Microwave test systems, including far-field, near-field, and compact range chambers for RCS and antenna measurement testing. Our global customers represent the automotive, defense/aerospace and wireless industries who value our decades of experience gained with over 10,000 installations, the convenience of our turn-key systems, and the support provided by our team of over 800 professionals worldwide. Visit our booth to learn more! Booth 401</td>
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<td>is the technological leader in power amplifier solutions for EW, Threat Simulation, Radar, Communications, and Product Testing. Our amplifiers incorporate the latest semiconductor and power combining technologies and with a patented architecture we build the most sophisticated and flexible COTS system amplifiers in the world. Solutions range from tens to multi-Kilowatt and includes basic PA modules to scalable rack systems with AGC and ALC output modes. In addition to best-in-class SWaP, our Next Generation amplifiers have sophisticated RF detection to maximize efficiency for a variety of modulation schemes including QAM-xx, OFDM, Multi-tone, Pulse, AM, FM, and more. Booth 111</td>
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<td>is a logistics management company with over 26 years of expertise in the procurement of RF and Millimeter-Wave components, systems and subsystems handling frequencies from DC to Terahertz. Impulse is a global leader and trusted adviser in providing value-based solutions as well as professional services to clients worldwide. Booth 408</td>
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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, measurement, 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.

Booth 211

Keysight Technologies, Inc. (NYSE: KEYS) is a leading technology company that helps enterprises, service providers and governments accelerate innovation to connect and secure the world. Keysight’s solutions optimize networks and bring electronic products to market faster and at a lower cost with offerings from design simulation, to prototype validation, to manufacturing test, to optimization in networks and cloud environments. Customers span the worldwide communications ecosystem, aerospace and defense, automotive, energy, semiconductor, and general electronics end markets. Keysight generated revenues of $3.9B in fiscal year 2018. More information is available at www.keysight.com.

Booth 210

Microwave Journal provides leading-edge technical content for RF, microwave and wireless engineers worldwide. MWJ the magazine reaches 50,000 qualified subscribers with practical design application articles for working engineers. MWJournal.com delivers the latest news, events, webinars, whitepapers, videos and newsletters to RF/microwave professionals. EDI CON China and USA events bring industry and engineers together for information exchange and education. For 61 years, Microwave Journal has been THE resource for engineers who are developing infrastructure for the next-generation of wireless and defense technologies.

Booth 107

Microwave Product Digest serves RF and microwave design engineers, research and development engineers, applications engineers, and engineering managers. These professionals, working in facilities that serve both the commercial and government markets, are involved with the design, development, application, and use of systems and subsystems, devices, and techniques involving frequencies from RF to light.

Grande Foyer

The Microwave Vision Group (MVG) is a premier supplier of antenna measurement and EMC testing solutions. Dedicated to the Aerospace & Defense, Satellite, Telecommunications, Automotive, EMC&CE industries as well as research institutes, we are the one-stop shop for turn-key systems, solutions and services for near-field and far-field antenna measurement, compact range, RCS and radar, as well as EMC testing. MVG brings together the technical expertise, product portfolios and infrastructures of four industry leaders: SATIMO, Orbit/FR, AEMI, & Rainford EMC. MVG is the natural choice for clients seeking complete, fast, accurate and reliable testing and measurement solutions.

Booth 103

Next Phase Measurements (NPM) is a California-based US company with a management team comprised of pioneers in the industry, recognized all over the world, for their experience and innovation in antenna measurements. NPM is the distributor and Value-Added Reseller (VAR) across both American continents for Antenna Systems Solutions, a leading supplier of antenna measurement systems to the worldwide Aerospace, Defense, Commercial, Automotive, Wireless, Academic and Research markets providing state-of-the-art positioning equipment, antenna design and manufacturing, near-field/compact antenna range systems, microwave anechoic chambers and contract research.

Booth 310

NSI-MI Technologies supports the aerospace-defense, automotive, wireless and academic industries with a comprehensive range of industry leading microwave test systems for antennas, radomes and RCS. Our unique blend of mechanical, RF and software engineering capabilities enable us to customize test systems for specialized solutions. Our wide range of products also allow us to offer solutions for material, production line or general automated component testing. NSI-MI’s global presence supports the highest quality service 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 303
<table>
<thead>
<tr>
<th>Company Name</th>
<th>Description</th>
<th>Booth Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPG Cuming Microwave</td>
<td>is a worldwide manufacturer of advanced engineered materials for aerospace, automotive, electronics, telecom, and medical industries. We design and manufacture RF anechoic chambers, and a wide range of RF absorbing and dielectric materials.</td>
<td>309</td>
</tr>
<tr>
<td>Planar Monolithics Industries, Inc.</td>
<td>was founded by entrepreneurial technocrat Dr. Ashok Gorwara on November 11, 1989. PMI was founded to take advantage of the growing demand in monolithic-based products using the Hybrid MIC/MMIC technology innovations that are mushrooming all over the world. High performance and reliable products can be obtained by using this technology. A vacuum exists in the demand for state-of-the-art Hybrid MIC/MMIC Components and Subsystems. Planar Monolithics will meet these requirements. PMI has been setup to Design, Develop, Manufacture, Test, and Market complex state-of-the-art: • Hybrid RF/Microwave and Monolithics Integrated Circuits (MIC/MMIC) and Components</td>
<td>213</td>
</tr>
<tr>
<td>QuarterBranch Technologies, Inc</td>
<td>was founded in 1998 to provide technical support and design services to the Radar Cross Section measurement community. Today, we have grown into the premier provider of these systems and support services. Our flagship system, RadarMan™, is the industry leading high-speed, broadband pulsed-IF radar system covering up to 0.1-40 GHz.</td>
<td>411</td>
</tr>
<tr>
<td>Quarterwave</td>
<td>manufactures Traveling Wave Tube (TWT) Amplifiers that range in power from 5 Watts CW to 50 kW pulsed. These amplifiers have become industry standard, since beginning of operation in 1987, for their reliable, stable, and low noise performance required for radar parameter measurement and microwave signal simulation for electronic warfare and training. Quarterwave’s customers include the FAA, U.S. Government, and major defense contractors.</td>
<td>410</td>
</tr>
<tr>
<td>Raymond EMC</td>
<td>is a manufacturer providing turn-key solutions in the design, fabrication, installation, testing and maintenance of custom RF shielded enclosures &amp; anechoic chambers for government, high tech, military, automotive, aerospace, medical and industrial applications. Raymond EMC is also the sole distributor for Eurotempest, providing high-assurance IT products to qualified defense and government customers.</td>
<td>206</td>
</tr>
<tr>
<td>Resonant Sciences</td>
<td>is a Research and Development firm located in Dayton, Ohio focused on developing and transitioning innovative technologies and solutions to developmental and operational platforms. Our areas of expertise include radome and antenna design and fabrication, custom electronic solutions, and RF measurements of materials, antennas, radomes, and subsystems. Our technical staff is nationally recognized for contributions to their respective areas of specialization. Our customers come from both the Government and commercial sectors. Our government customers are from the Department of Defense and other governmental agencies. Our commercial customers span from the aerospace industry to the auto industry.</td>
<td>409</td>
</tr>
<tr>
<td>RF Globalnet:</td>
<td>The Pulse Of RF &amp; Microwave Engineering, serving the needs of engineering professionals since 1996. We provide RF/microwave engineers with the tools they need to do their jobs, offering a vast technical library, a new products directory, the latest industry news, downloadable software, technology-specific Resource Centers, and more.</td>
<td>Grande Foyer</td>
</tr>
</tbody>
</table>
Rohde & Schwarz develops, produces and markets test & measurement, information and communications technology. It focuses on test and measurement, broadcast and media, cybersecurity, secure communications and monitoring and network testing, areas that address many different industry and government-sector market segments. Specifically: test and measurement for the wireless market, automotive industry, aerospace and defense, industrial electronics and research and education, broadcast and media for network operators, consumer electronics manufacturers and content providers, cybersecurity solutions for business and government authorities, communications and security solutions for critical infrastructures, reconnaissance equipment for homeland and external security, communications and reconnaissance equipment for armed forces.

Booth 207

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. The average 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.

Booth 100

STAR Dynamics, a US Veteran Owned Small Business, is the key provider of leading-edge Instrumentation Radars for multiple defense industries. STAR is committed to the Low-Observable community providing highly enhanced, ultra-wideband BlueMax RCS/Imaging Radars and KNOWBELLTM Radar Signal Processing technologies. Multiple-object, test range, precision tracking radars are now being deployed, leveraging industry-recognized subject matter expertise to enhance defense technology development and validation. STAR provides premium aftermarket support with unmatched product capability and reliability. STAR’s mission statement, Inspiring Innovation, exemplifies its reinvestment strategy for advancing technology to provide continuous innovation for leading-edge radar systems in the best interest of national defense.

Booth 203

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 208

VDI 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.

Booth 205

WavePro established in 1993 an EM test ranges provider based in Taiwan. During the 26 years, over 170 EM test ranges being successfully installed, including Near-Field Systems, Far-Field Systems, Compact Antenna Test Ranges and Radar simulation Ranges. Over 20 high-performance roll-edged CATRs being delivered, include Huawei project over 6 meters large CATR for their benchmark 5G certification lab. The current main focus of WavePro is superior performance CATR, 5G base station CATR system, 5G 3GPP compliance CATR, Automotive radar tester, Spherical NF, Chip antenna measurement system, VHF low frequency test ranges, Taper chamber replacement broadband anechoic chamber, Vehicle test chamber.

Booth 106
Hotel Floor Plan