

ADVANCE PROGRAM
REGISTRATION FORM

**The Antenna Measurement Techniques Association
(AMTA)**



In Cooperation with the

IEEE San Diego Section

and the

IEEE Los Angeles and San Diego Chapters of the Antennas and Propagation Society
Electromagnetic Compatibility Society and Electron Devices Society



Proudly Presents

**Emerging Antenna and Co-Existence Technologies
for Wireless Applications**

Monday, 22 April 2013

**The Hilton San Diego Bayfront Hotel
San Diego, California**

Program Agenda

7:30 am	REGISTRATION & CONTINENTAL BREAKFAST
8:30 am	IEEE/AMTA Welcome <i>Professor Chi-Chih Chen, The Ohio State University</i> <i>AMTA Technical Coordinator</i> <i>Tony Babaian, IEEE San Diego APS and EDS Chair</i>
8:45 am	Compact GPS/GNSS Antenna Designs <i>Professor Chi-Chih Chen, The Ohio State University, Columbus, Ohio</i>
9:30 am	Interference Issues Related to Personal Electronic Devices (PEDs) – Achieving Co-Existence <i>Mr. Harry Skinner, Senior Principal Engineer, Intel, Hillsboro, Oregon</i>
10:15 am	BREAK
10:45 am	Real World Over-The-Air Performance Measurements of Wireless Devices <i>Mr. Garth D'Abreu, Technical Manager of the RF Engineering Group</i> <i>ETS-Lindgren, Cedar Park, Texas</i>
11:30 am	Mobile Antenna Design Challenges <i>Dr. Allen Tran, Vice President of Engineering, Qualcomm Technologies</i> <i>San Diego, California</i>
12:15 pm	LUNCH
1:15 pm	A Fast-Fading Mobile Channel Measurement System <i>Dr. Bob Johnk, Institute for Telecommunication Sciences</i> <i>(NTIA/ITS), Boulder, Colorado</i>
2:00 pm	Anisotropic, Nonlinear, and Active Artificial Impedance Surfaces <i>Professor Dan Sievenpiper, University of California – San Diego</i>
2:45 pm	BREAK
3:00 pm	Commercial Aircraft Antenna Measurements for the Allowance of Wireless Devices Onboard: An Aerospace Industry Perspective <i>Mr. Kenneth Kirchoff, 787 Cabin Systems R&D Engineer</i> <i>The Boeing Company, Seattle, Washington</i>
3:45 pm	Challenges in Disaster Recovery Communications: Antennas, Interference and Cognitive Systems <i>Dr. Daniel Devasirvatham, Founder and President</i> <i>Wi-Plan Wireless Consulting, San Diego</i>
4:30 pm	CONCLUDING REMARKS <i>Professor Chi-Chih Chen, The Ohio State University</i> <i>AMTA Technical Coordinator</i>
4:40 pm to 5:30 pm	RECEPTION WITH SPEAKERS AND EXHIBITORS

TECHNICAL PROGRAM *Presentation Abstracts*

Compact GPS/GNSS Antenna Designs

Professor Chi-Chih Chen, The Ohio State University, Columbus, Ohio

Abstract: Global navigation satellite systems (GNSS) including GPS, GLONASS, Galileo, and Compass are revolutionizing the way we and our technology move around the world. GNSS receivers will undoubtedly be ubiquitous in every part of our life from navigation, tracking, sensing, to data logging. Most GPS/GNSS receivers use only one antenna. Some advanced applications require multiple antenna elements in conjunction of smart processing algorithms to provide better position accuracy and reliable operations. Where a GPS/GNSS receiver can be used is only limited by the size, weight, and bandwidth of its antenna that is responsible for receiving the very weak signals from GNSS constellations. This presentation discusses common performance requirements and design issues associated with small GPS/GNSS antennas. Several novel compact GPS/GNSS antenna design examples will also be presented.

Interference Issues Related to Personal Electronic Devices (PEDs) – Achieving Co-Existence

Mr. Harry Skinner, Senior Principal Engineer, Intel, Hillsboro, Oregon

Abstract: With the advent of Mobility as a value vector in devices, communications and compute are no longer distinguishable. There is an expectation from the user that it ‘just works’, and that in today’s demanding usage and emerging form factors is not a given (video streaming, instant access to cloud data, fast/reliable connections, simultaneous voice/data). For far too long the RF, compute and form factor start off being designed in isolation. It’s when they are all brought together that the problems start and 4 or 5 design iterations are not untypical before the device finally sees the light of day. This talk will address interference issues as a very real performance and time to market (TTM) limiter, why meeting EMI/EMC regulatory requirements is at best a good starting point, why today’s mitigation approaches are not sustainable and what can and should be done to ensure these devices work as advertised.

Real World Over-The-Air Performance Measurements of Wireless Devices

Mr. Garth D’Abreu, Technical Manager of the RF Engineering Group, ETS-Lindgren

Rooted in the simplicity of its hardware implementation and the elegance of its statistical behavior, the reverberation chamber (RC) has been found to be an economical and effective test environment for a great diversity of applications. Not only in EMC testing has the reverberation chamber been widely utilized, but also in various wireless test applications. Among the wireless test applications, Multiple Input, Multiple Output (MIMO) is undoubtedly one of the major applications that can make good use of RC test methodology due to the nature of MIMO multi-reflection coinciding with the RC core concept. Another interesting application arises from the increasing demand of in-flight wireless access; in such a spacious environment as an airplane, the concept of frequency-stirred RC is implemented to evaluate RF propagation in an aircraft cabin. This presentation will cover the most updated developments in reverberation chamber wireless test applications.

Mobile Antenna Design Challenges

Dr. Allen Tran, Vice President of Engineering, Qualcomm, San Diego, California

Abstract: The number of radios and supported frequency bands for portable wireless devices continue to increase at a very rapid pace due to constant demands for new features and higher data throughput. The new generation of smart phones and tablets is much thinner than before and tightly packed with multiple cameras, stereo speakers and other multimedia components. This has posed a huge antenna design challenge for the mobile wireless platforms. An overview of various technical challenges in mobile antenna design will be discussed.

A Fast-Fading Mobile Channel Measurement System

Dr. Bob Johnk, Institute for Telecommunication Sciences (NTIA/ITS), Boulder, Colorado

Abstract: Dr. Johnk will describe a prototype propagation measurement system based on a combination of a spectrum analyzer and a vector signal analyzer. The system is designed to measure the characteristics of a narrowband mobile radio channel. We present results from a commercially-available fading simulator and fixed-to-mobile measurements performed in Boulder, Colorado. The results obtained look promising and the system demonstrates excellent measurement fidelity.

Anisotropic, Nonlinear, and Active Artificial Impedance Surfaces

Professor Dan Sievenpiper, University of California – San Diego

Abstract: Dan Sievenpiper’s Applied Electromagnetics Group at UCSD is focused on artificial electromagnetic media, and the integration of active electronics with electromagnetic structures, including antenna arrays, metamaterials, impedance surfaces, and other structures. This talk will focus on several topics of our current research. In particular, we will discuss the use of anisotropic impedance surfaces to enable cloaking of surface wave features on metallic bodies. We will also describe our work on nonlinear absorbing surfaces to mitigate damage from high-power microwaves, and how the use of nonlinear circuits enables decoupling of the high-power absorption properties of a surface from its small signal scattering behavior. Finally, we will discuss non-Foster circuits for electromagnetics, including how to design for stability, and their use in broadband small antennas and superluminal waveguides.

Commercial Aircraft Antenna Measurements for the Allowance of Wireless Devices Onboard: An Aerospace Industry Perspective

Mr. Kenneth Kirchoff, 787 Cabin Systems R&D Engineer, The Boeing Company, Seattle, Washington

Abstract: As more airlines around the world are installing passenger communication systems that enable the use of passenger-owned intentionally transmitting portable electronic devices (T-PEDs) there is a requirement from an airplane safety perspective to ensure electromagnetic compatibility between the T-PEDs and the airplane communication, navigation and surveillance (CNS) systems. An FAA advisory special committee, SC-202, was convened to produce an industry accepted method for measuring the interference path loss (IPL), which is the coupling between a transmitter onboard the airplane and the airplane CNS antennas. Full scale airplane testing was undertaken to compare traditional deterministic test methods to a new statistical test approach. This presentation outlines a new method for determining the IPL for each CNS system that utilizes a statistical approach to find the upper bound coupling with known confidence levels.

Challenges in Disaster Recovery Communications: Antennas, Interference and Cognitive Systems

Dr. Daniel M. Devasirvatham, Founder and President, Wi-Plan Wireless Consulting San Diego, California

Abstract: Experience in large disasters highlights the need to quickly recover communications operability in large incidents such as earthquakes and storms. Recent incidents show that the best efforts of humans often fail in a major event. A widespread incident such as the earthquake and tsunami in Japan, Hurricane Sandy, or a more contained quake in Haiti can cause major disruptions and leave the populace stranded without first response to provide immediate help. Also, the shortage of information and guidance to the population can jam any remaining communications. Hence, a quick and integrated recovery of LMR and broadband first responder and civilian communications is essential after a large incident. This talk presents disaster recovery as an orderly, layered, multi-stage process using satellite communications, airborne relays and networks to substitute for damaged infrastructure to re-enable user terminals of all sorts. The attendant challenges in coverage and interference and the use of Cognitive Radio Systems to manage this complex environment will be explored.

SPEAKER BIOGRAPHIES

Professor Chi-Chih Chen received his MS and Ph.D. degrees from the Ohio State University Electrical and Computer Engineering Department in 1993 and 1997, respectively. He has been with The Ohio State University ElectroScience Laboratory as a Postdoctoral Researcher (1997~1999), Senior Research Associate (1999-2003) and Research Scientist in (2004~2011). In 2011, he became a Research Associate Professor of The Ohio State University Electrical and Computer Engineering Department. Dr. Chen's research interest in antenna development includes ultra wideband (UWB) antennas, UWB dielectric antennas, small antennas, compact GPS and GNSS antennas, VHF/UHF body wearable antennas, UWB phase array antennas for very wide scanning angles. His other research activities also include RFID, RF energy harvesting, ground penetrating radars (GPR), vehicular radars, and RF material measurements. He has published 45 journal papers, five book chapters, one co-authored book, and more than 80 technical reports. He has given several short course lectures on miniature antenna design, GPR Technology, and UWB antenna designs. Dr. Chen received OSU College of Engineering Lumley Research Award in 2004 and 2010, and became an AMTA Fellow in 2010. He was the Technical Chair of the 2006 International GPR Conference. He has been serving on the International Advisory and Science Committees of the International GPR Conference since 2006. He is currently an elected member of the AMTA Board of Directors serving as the Technical Coordinator since 2011. He is senior member of IEEE, a member of the Society of Exploration Geophysicists, Institute of Navigation, Sigma Xi, and Phi-Kappa-Phi.

Mr. Harry Skinner is a Senior Principal Engineer in Intel Labs. Since joining Intel in 1996, Harry has held a variety of positions, all dealing with Electromagnetic Compatibility (EMC). For the vast majority of his tenure Harry has directed Intel's EMC/EMI Research and Development while driving industry EMC guideline development for initiatives such as PCI Express* and SATA. More recently Harry has been driving Intel's research for Radio Frequency Interference (RFI) and Antennas. Other noteworthy projects include dithered clocks for IA platforms (SSC), ATX SE EMI containment guidelines (u-seam and waveguide implementations), and EMI design of Intel's mobile modules. Before coming to Intel, Harry spent six years with IBM. He has been awarded nine patents, has multiple patents pending, and has published numerous papers at IEEE symposiums and other technical forums. He is a fully-fledged member of IEE (Institute of Electrical Engineers—U.K.). Harry received a first-class honors Bachelor of Engineering (B.Eng) degree in electronics and electrical engineering from the University of Glasgow, Scotland.

Mr. Garth D'Abreu is the Technical Manager of the RF Engineering Group at ETS-Lindgren in Cedar Park, Texas. He has primary responsibility for the design and development functions within the RF engineering group. The RF group provides technical support for ETS-Lindgren worldwide and is responsible for anechoic chambers, E Field generators, TEM cell device design and development, antenna design and absorber development. Mr. D'Abreu is the lead engineer for reverberation chamber design and testing and is responsible for the development of GTEM cells, products for EMP applications and wireless device test systems. He holds a BSc degree in Electronics & Communications Engineering, North London University, UK. He is a member of the IEEE EMC Society and has over 20 years experience in the RF industry.

Dr. Allen Tran received PhD and MS degrees in Electrical Engineering from UCLA, and BS degree also in Electrical Engineering from University of California, San Diego. Currently, he holds the position of Vice President of Engineering at Qualcomm Technologies Incorporated where he leads the Corporate R&D antenna group and guides antenna related research for wireless communication. Prior to joining Qualcomm, he worked in the Antenna Department of Hughes Radars System Division conducting antenna designs for airborne radars, automobile collision avoidance system, DirecTV, and point-to-point communication. Dr. Tran has over 20 years of antenna design and research experience spanning over a wide range of applications from small commercial cellular handset to large military phased array radar. He has over 40 issued US patents.

Dr. Bob Johnk received his Ph.D. in Electrical Engineering at the University of Colorado in 1990, where he specialized in electromagnetics, propagation, and antennas. Bob is currently an electronics engineer at the Institute for Telecommunication Sciences (NTIA/ITS) where he is engaged in public safety radio and mobile radio propagation research. Prior to joining NTIA/ITS in 2007, he was with the National Institute of Standards and Technology (NIST) in Boulder, Colorado for 17 years where he was the leader of the time-domain fields project. Bob has received best paper awards from the IEEE EMC Society, NIST, and NTIA. In 2011, Bob received the Technical Achievement Award from the IEEE EMC Society for his work "in the development of free-space time-domain measurement techniques". Bob enjoys spending time with his wife Loan (married for 35 years!) and sons Kevin and Ben. Bob holds both an extra class amateur radio license and a General Radio Telephone License with ship radar endorsement, and he thoroughly enjoys radio. Bob also likes astronomy, computers and most other geeky things. One of Bob's favorite activities is biking and taking walks with his wife in the beautiful Colorado sunshine.

Professor Dan Sievenpiper joined the UCSD faculty in 2010. He received his BS in 1994 and his PhD in 1999 from UCLA, where he studied photonic crystals and periodic structures, and invented the high impedance electromagnetic surface. After graduation, Dan joined HRL (the former Hughes Research Laboratories) in Malibu, CA. During the following 11 years, he developed new electromagnetic structures, with an emphasis on small, conformal, tunable, and steerable antennas. Dan held a variety of technical positions at HRL, including serving as the director of the Applied Electromagnetics Laboratory. At UCSD, his research is focused on artificial media, and the integration of active electronics with electromagnetic structures and antennas to enable new capabilities. In 2008, Dan was awarded the URSI Issac Koga Gold Medal. In 2009, he was named as a Fellow of the IEEE. Dan has more than 70 issued patents and more than 60 technical publications.

Mr. Kenneth Kirchoff received his BS EE (Cum Laude) from Seattle University and has completed MS EE courses at Columbia University in New York and the University of Washington in Seattle. Kenneth has served on FAA advisory committees as a chairman of technical working groups, advised foreign regulatory bodies such as the MIC in Japan on safety aspects of wireless devices onboard airplanes and currently serves as a co-chair of the ARINC AEEC Cabin Systems

Subcommittee technical working group for wireless systems onboard airplanes. Kenneth has worked at the Boeing Company for 22 years, spending time as an electromagnetic effects engineer on programs such as the 767 Tanker and Connexion by Boeing® and as a systems engineer in cabin systems working on onboard mobile telephony systems. Kenneth currently serves as the principle investigator in 787 Cabin Systems research and development working on such technologies as software defined radio, aircraft wireless infrastructure and synthetic aperture scanning. He also serves as the Boeing spokesman on the safe use of Portable Electronic Devices onboard airplanes.

Dr. Daniel Devasirvatham is Founder and President of Wi-Plan Wireless Consulting. Previously, he was CTO of the Advanced Technology Division at SAIC and worked on Broadband and in Land Mobile Radio communications for public safety. He was the Chief Technologist of the DHS/ICTAP program and participated in P25 standards, first responder support, educational outreach and exercise evaluation. He was SME and part of the numbering administration chartered by the FCC for LTE Public Safety Broadband trials, and is participating in US and Canadian technical working groups. Daniel has published in IEEE and other peer-reviewed journals on radio communications, and chairs the Software Defined Radio Forum / SDR Forum/WInnForum effort on Developing a Hybrid Airborne, Terrestrial, and Satcom Architecture for Disaster Recovery (HyCoR). He was an invited presenter at the FCC workshop on Deployable Aerial Communications Architectures (DACA). Daniel is a member of the APCO (Association of Public Safety Communications Officials) Broadband Committee, Standards Development Committee and, earlier, in its Homeland Security Committee. He participated in post 9/11 and Katrina review panels. He has authored APCO and SDR Forum papers on Disaster Recovery Communications. Earlier, Daniel was Director of Advanced Wireless Technologies Research at Telcordia Technologies/Bellcore. He led research in radio wave propagation, cellular system deployment, smart antennas for high capacity mobile communications, and spectrum sharing. Daniel holds patents in spectrum sharing and energy efficient communications. He obtained his PhD in Satellite Communications as a Fulbright Scholar at The Ohio State University. Daniel is a Senior Member of the IEEE.

[Event Overview](#)

The Program

This program was designed to bring the latest technology related to wireless and antenna measurement techniques to the local community. Experts in the industry will share practical information on various topics in an extended presentation format. This allows a thorough discussion of each topic and provides the opportunity for extended questions and answers. The “hands-on” quality of the presentation enables the registrant to learn useful information that can be used on the job – in the “real world.”

The Exhibition & Reception

There will be an exhibition by vendors of wireless, antenna, test and measurement related products and services in a ballroom neighboring the technical presentation area. These products and services address the needs of the commercial, military, and aerospace industries. During the reception from 4:40 to 5:30 pm in the exhibit area, heavy appetizers and a hosted bar will be available. AMTA and IEEE members are welcome to attend the reception only at NO CHARGE provided a registration form is completed and sent in advance. A badge will be available for the reception only attendees upon arrival at 4:30 pm. *Thus, if you can't join us for the entire day, drop by for the reception and exhibition to network with AMTA and IEEE. You can see demonstrations, meet the speakers, and you might even win a raffle prize!*

[Colloquium and Exhibition Location](#)

The Hilton San Diego Bayfront

1 Park Blvd, San Diego, CA 92101 - (619) 564-3333

Hotel Guest Room and Parking Information

A limited number of guest rooms are being held for "AMTA/IEEE" at the rate of \$159.00 (includes wireless internet access in the guest room), plus tax, for single or double occupancy, and are available on a first come, first serve basis. **Please reserve by the cut-off date of Sunday, March 31 to ensure guest room availability.** Call the hotel directly at (619) 564-3333 or at 1-800-HILTONS. Discounted self-parking is available for overnight hotel guests at \$22. Discounted parking for event attendees is \$15, or \$7.00 with validation.

Organizing Committee

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REGISTRATION FEES

AMTA/IEEE Members, Received by March 21	\$135
AMTA/IEEE Members, Received March 22 - April 15	\$195
AMTA/IEEE Members, After April 15 and On-Site	\$245
Non Member Additional Charge*:	\$50
Full-time Students with copy of valid Student I.D., Received by April 1:	\$45
NOTE: Unemployed/retired attendees: Take a 50% discount off the AMTA/IEEE Member fees above.	
*Includes one year membership in AMTA.	

NOTE: The registration fee includes one copy of the colloquium record, continental breakfast, lunch, refreshment breaks, and the reception. The organizing committee reserves the right to substitute speakers, restrict size, or to cancel the colloquium and exhibition. In the event the organizing committee cancels this event, registration fees only will be fully refunded. Individuals canceling their registration prior to March 22 will receive a full refund. No refunds will be made to individuals who cancel their registration after March 22. Substitutions are allowed. Attendance is limited. Registration will be confirmed on a first come, first served basis.

Registration Information

Please print clearly

Name: _____
Title: _____
Company: _____
Street Address: _____
City: _____ State: _____ Zip: _____
Daytime Phone: _____
E-mail Address: _____
AMTA or IEEE Member: Y ___ N ___
IEEE #: _____
Full-time Student: Y ___ N ___
School: _____
(Please attach copy of Student ID to obtain Student rate.)

Registration by Mail/Fax/E-mail

Registration Total per Fees Above

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

Or

Credit Card Payment – Please Provide:

Name on Card: _____
Credit Card No: _____
Expiration Date: _____
Amount Charged: \$ _____

Signature: _____

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