



Join the IEEE Seattle Section to Celebrate IEEE Day!

IEEE Day celebrates the first time in history when engineers worldwide and IEEE members gathered to share their technical ideas in 1884. IEEE Day is officially October 3.



IEEE

**EMC
SOCIETY**



MTT-S IEEE Microwave Theory and Techniques Society

IEEE Seattle EMC/MTT/AP/ED Joint Chapter Meeting Announcement

Smart Antennas for IoT and 5G: Recent Advances for Commercial and Aerospace Applications

An educational seminar at the Museum of Flight

This is a free seminar to celebrate “[IEEE Day](http://www.lionheartnw.com/ieee-day)”, but you must register in advance to assure your space. Visit: <http://www.lionheartnw.com/ieee-joint-chapter-event.html> to save your seat!

Date: Friday, October 6, 2017

Time:	10:00 am:	Coffee service and registration
	10:30 am:	Welcome and Keynote Presentation by Professor Balanis
	12:00 pm:	Buffet Lunch
	1:15 pm:	IEEE Day Overview
	1:30 pm:	Additional presentations with a short break in between (See technical program below)
	3:00 pm:	RAFFLE/Adjourn
	3:05 pm – 5:00 pm:	OPTIONAL – Free self-guided tour of Museum of Flight

Speakers: Prof. Constantine Balanis of Arizona State University
Jari Vikstedt of ETS-Lindgren, Anil Kumar of Boeing
(See biographies below)

Location: Museum of Flight, Boeing Field, Seattle Washington
See www.museumofflight.org for more details

Directions: [9404 E Marginal Way S Seattle, WA 98108](http://www.google.com/maps) (click for Google Maps)
(206) 764-5720 - Take exit 158 from I-5. Go west.
Turn right at the first light (E. Marginal Way S.) - The Museum is on the right, 1/2 mile.

Register: Seating is limited!! Register online now to save your space!
<http://www.lionheartnw.com/ieee-joint-chapter-event.html>

Several exhibitors will be available to discuss your needs – see below for more information.

TECHNICAL PROGRAM

Smart Antennas: Technology Integrating Antennas, DSP, Communications and Networks

By Prof. Constantine A. Balanis, Regents' Professor, Department of Electrical Engineering, Arizona State University, Phoenix, Arizona

Abstract: As the demand for mobile communications is constantly increasing, the need for improved capacity, greater coverage and higher transmission quality rises. Therefore, a more efficient use of the radio spectrum is required. Smart antenna systems are capable of efficiently utilizing the radio spectrum, and they are a promise for an effective solution to meet the desired performance demands in network and communication systems. Smart antenna technology has been considered for mobile platforms such as automobiles, cellular phones (mobile units), and laptops. Smart antennas integrate many technologies, including antennas, digital signal processing, communications and networks. The advancement and integration of the characteristics of each of these areas is critical to the efficiency and performance of a communication system channel, as measured by Bit-Error-Rate (BER) and network Throughput. This presentation reviews the basic principles of smart antennas, and it presents and compares the BER and Throughput of different antenna array geometries, such as the uniform rectangular array (URA).

Test Challenges of Smart Antenna Systems

Jari Vikstedt, Manager – Wireless Solutions, ETS-Lindgren, Cedar Park, Texas

Abstract: The proliferation of wireless technologies into every corner of our lives, starting with traditional cellular and wireless LAN technologies and leading to the impending evolution of connected cars and the “Internet of Things,” all require the use of one common asset - bandwidth. While the traditional approach to added bandwidth is simply to use more RF spectrum, the availability of spectrum, especially at frequencies compatible with most of today’s applications, is severely limited. Technologies continue to evolve to make better utilization of the available bandwidth, including MIMO, beam forming, spectrum sharing and reuse, etc. The added complexity of these “smart” antenna systems carries over into the complexity of trying to test radios using these technologies. Smart antenna systems that adapt to their environment are not likely to perform the same way in a traditional laboratory test as they would in the real world. Thus, the laboratory test methodologies must advance to keep up with these innovations to be able to determine the expected over-the-air performance of these devices without requiring an unlimited number of test cases. This presentation will provide an overview on the evolving 5G and mmWave technologies and the resulting dramatic changes to the wireless industry that will impact the way all RF and EMC testing of devices is performed.

The Wireless Aircraft Cabin – 60 GHz

Anil Kumar, Technical Fellow, The Boeing Company, Seattle, Washington

Abstract: This presentation reviews the recent results on the measurements of 60 GHz RF signal in an aircraft cabin to support broadband wireless applications. The viability of mmWave technology on aircraft with some specific applications are discussed and established. The advantages of adopting a 60 GHz band wireless technology (WiGiG) over the Wi-Fi LANs in the lower frequencies are discussed. Finally, a number of outstanding technical challenges to support high throughput at low latency are identified for further study.

SPEAKER BIOGRAPHIES



Dr. Constantine A. Balanis (S'62 - M'68 - SM'74 - F'86 – LF'04) received the BSEE degree from Virginia Tech, Blacksburg, VA, in 1964, the MEE degree from the University of Virginia, Charlottesville, VA, in 1966, and the Ph.D. degree in Electrical Engineering from Ohio State University, Columbus, OH, in 1969. From 1964-1970 he was with NASA Langley Research Center, Hampton VA, and from 1970-1983 he was with the Department of Electrical Engineering, West Virginia University, Morgantown, WV. Since 1983 he has been with the School of Electrical, Computer and Energy Engineering, Arizona State University, Tempe, AZ, where he is Regents' Professor. His research interests are in computational electromagnetics, flexible antennas and high impedance surfaces, smart antennas, and multipath propagation. He received in 2004 a Honorary Doctorate from the Aristotle University of Thessaloniki, the 2014 LAPC James R. James Lifetime Achievement Award (UK), the 2012 Distinguished Achievement Award of the IEEE Antennas and Propagation Society, the 2012 Distinguished Achievement Alumnus Award (College of Engineering, The Ohio State University), the 2005 Chen-To Tai Distinguished Educator Award of the IEEE Antennas and Propagation Society, the 2000 IEEE Millennium Award, the 1996 Graduate Mentor Award of Arizona State University, the 1992 Special Professionalism Award of the IEEE Phoenix Section, the 1989 Individual Achievement Award of the IEEE Region 6, and the 1987-1988 Graduate Teaching Excellence Award, School of Engineering, Arizona State University. Dr. Balanis is a Life Fellow of the IEEE. He has served as Associate Editor of the IEEE Transactions on Antennas and Propagation (1974-1977) and the IEEE Transactions on Geoscience and Remote Sensing (1981-1984); as Editor of the Newsletter for the IEEE Geoscience and Remote Sensing Society (1982-1983); as Second Vice-President (1984) and member of the Administrative Committee (1984-85) of the IEEE Geoscience and Remote Sensing Society; and Distinguished Lecturer (2003-2005), Chair of the Distinguished Lecturer Program (1988-1991), member of the AdCom (1992-95, 1997-1999) and Chair of the Awards and Fellows Committee (2009-2011) all of the IEEE Antennas and Propagation Society. He is the author of *Antenna Theory: Analysis and Design* (Wiley, 2005, 1997, 1982), *Advanced Engineering Electromagnetics* (Wiley, 2012, 1989) and *Introduction to Smart Antennas* (Morgan and Claypool, 2007), and editor of *Modern Antenna Handbook* (Wiley, 2008) and for the Morgan & Claypool Publishers, series on Antennas and Propagation series, and series on Computational Electromagnetics.



Jari Vikstedt is the Manager, Wireless Solutions for ETS-Lindgren in Cedar Park, Texas. He has over 20 years of experience with ETS-Lindgren in developing and testing RF test solutions for both EMC and Wireless applications. Mr. Vikstedt and the other engineers at ETS-Lindgren are active technical contributors to the leading wireless industry organizations, including the CTIA, 3GPP, IEEE and the Wi-Fi Alliance®. Recently Mr. Vikstedt has devoted his expertise to the development of CTIA and 3GPP Over-The-Air (OTA) testing solutions as well as developing innovative 5G OTA test solutions. He holds a BSEE degree in RF Engineering from the Turku University of Technology, Finland.



Anil Kumar is a subject matter expert in RF and signal processing with focus on wireless and satellite communications on Boeing commercial and military platforms. He is the Chief Architect of Networks & Communication Systems with the Cabin & Networks group. He was responsible in obtaining global spectrum licenses to operate wireless systems on board aircraft. As a lead architect on the BCA Flyaway RFID initiative he has developed a scalable solution to connect aircraft parts to the network. He is currently working on conformal SATCOM antenna systems and mmWave technology applications on BCA platforms. Anil is a Boeing Technical Fellow and a member of IEEE Communications Society. He holds Master's degree from the Indian Institute of Technology, Delhi, in Communications & Radar engineering.

Calling All EMC and Antenna Exhibitors!

Seattle EMC Chapter: Exhibition on October 6, 2017 Museum of Flight – Seattle, WA

There will be a small tabletop exhibition during the October 6 seminar at the Museum of Flight in Seattle. **Due to limited space, only 12 tables are available on a first come, first served basis.**

Details:

- Tables are each 30"W x 72"L and are available for **\$450 per table**.
- Promotional opportunities may be secured by issuing a check payable in full to "Seattle EMC Chapter" and sending to: Janet O'Neil, 49 Prospect Ave., Long Beach, CA 90803 – OR – pay on line at <http://www.lionheartnw.com/ieee-joint-chapter-event.html>. **Space will be confirmed in order of payment received until space is sold out.**
- Exhibitors are limited to what can be placed on the table only. No exceptions!
- Only one table is allowed per company.
- All exhibitors may set up starting at 9:00 am and must be torn down by 4:00 pm on Oct 6.
- Exhibit hours are 10:00 am – 3:00 pm.
- All exhibitors will receive an attendee list prior to the seminar and a final version following the seminar.
- Contact Janet O'Neil at 425-443-8106 or at j.n.oneil@ieee.org to reserve your space.

Event Organizing Committee – IEEE Seattle EMC Chapter

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IEEE Seattle MTT/AP/ED

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