IEEE EMC Society Chapter Meeting Announcement
The Los Angeles, Seattle, Syracuse, Central Texas, Phoenix, Santa Clara, San Diego, Central New England, Vancouver BC, Benelux, Buenos Aires, Italy, Poland, Switzerland, and UK/Ireland EMC Chapters, Announce a LIVE Webinar:

Emerging Technologies: The Impact of Modern Robotics, Data Analysis, and CEM Simulation on Antenna and EMC Measurements in 2021 and Beyond!

Date: **Tuesday, December 15, 2020**

Time:	8:00 am PST	**Welcome and Announcements** – *Mr. Dennis Lewis, Technical Fellow, The Boeing Company, Seattle, WA; Chair, IEEE EMC Society Seattle Chapter*
	8:05 am	**Traditional to Modern Antenna Test Environments: Overview of a New Dual Multi-Axis Robotic Antenna Test System Highlighting the Impact of Modern Robotics and CEM Simulation** – *Professor Stuart Gregson, Director of Operations and Research, Next Phase Measurements LLC, Garden Grove, CA*
	8:30 am	**Extending the Usable Low Frequency Range of an Anechoic Chamber for Antenna Calibrations Using a Time Domain Deconvolution Filter** – *Mr. Zhong Chen, Director of RF Engineering, ETS-Lindgren, Cedar Park, TX*
	8:50 am	**An Overview of Hybrid Computational Techniques for Antenna Measurement System Design** – *Mr. Jason Bommer, Lead Application Engineer, Ansys, Seattle, WA*
	9:10 am	**Q&A with the Speakers** – *Moderated by Mr. Lewis* ***(See presentation abstracts and speaker bios below.)***
	9:30 am	Wrap Up/Final Comments

Register: Click here to register now on line or enter the following on your browser: https://attendee.gotowebinar.com/register/4341894863474271759

Questions: Janet O'Neil, ETS-Lindgren, cell (425) 443-8106, email j.n.oneil@ieee.org

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TECHNICAL PROGRAM

Traditional to Modern Antenna Test Environments: Overview of a New Dual Multi-Axis Robotic Antenna Test System Highlighting the Impact of Modern Robotics and CEM Simulation
By Professor Stuart Gregson, Director of Operations and Research with Next Phase Measurements LLC, Garden Grove, CA

Abstract: Traditional antenna test facilities are designed with specific measurement applications in mind. As a result, these facilities tend to have fixed measurement geometries with much of the range performance analysis

being performed only once — during the design phase of the test facilities implementation. Modern antenna measurement ranges employing multi-axis robotic positioners provide a near limitless degree of re-configurability in terms of measurement types and scan geometries, driving an ongoing need to evaluate each unique setup and application. Model Based Systems Engineering and Development (MBSE/MBD) approaches can be employed to dramatically reduce the time, effort, and cost associated with the test development and validation phases of a given program. This presentation provides an overview of a new dual multi-axis robotic antenna test system that utilizes the novel coordinated use of a pair of 6-axis robots and MBSE/MBD system engineering within its development. A detailed description of this system that considers the mechanical, RF, safety, and data processing aspects of the system is presented. The use of this system in the acquisition of spherical, cylindrical, and variable orientation planar near-field data as well as far-field and extrapolated gain measurements is presented and discussed with the use of CEM during the development program being highlighted.

Extending the Usable Low Frequency Range of an Anechoic Chamber for Antenna Calibrations Using a Time Domain Deconvolution Filter
By Mr. Zhong Chen, Director of RF Engineering with ETS-Lindgren, Cedar Park, TX

Abstract: It is usually impractical to calibrate antennas in an anechoic chamber down to the VHF frequency range because absorbers do not perform adequately at these frequencies. Time domain gating can be used to the extent that the antenna ring-down time is short enough, and the reflections are far enough away, so that a gate can be applied without cutting into the antenna intrinsic response. Although it is possible to apply time domain gating at a closer distance in many chambers, it is typically not feasible to do so in the far field, where the path lengths of the reflected signals are too close to that of the direct signal. In this study, we investigate calibrating broadband biconical antennas from 75 MHz to 2 GHz in a chamber designed for above 1 GHz measurements (in which the absorbers have severely degraded performance in the VHF frequency range, and chamber walls are too close to be gated out directly) using a time domain deconvolution filter before a gate is applied. After applying the deconvolution filter acquired from a 3 m measurement in the same chamber, we successfully obtained the free space response at a far field distance (e.g., 8 or 9 m) for biconical antennas operating from 75 MHz to 2 GHz.

An Overview of Hybrid Computational Techniques for Antenna Measurement System Design
By Mr. Jason Bommer, Lead Application Engineer with Ansys, Seattle, WA

Abstract: Model-based systems engineering (MBSE) affords significant benefits to the design and optimization of antenna measurement and calibration systems. Through complementary numerical techniques such as the finite element method (FEM), integral equations (IE), finite element boundary integral (FEBI), as well as shooting and bouncing rays (SBR), one can gain significant insight on performance even before the measurement facility is constructed or the system fully configured. This can reduce or eliminate significant test burden such as initial reference measurements along with associated costs. Furthermore, by combining full wave and asymptotic techniques, it is feasible to construct virtual prototypes that are computationally practical even at enormous scale and electrical size. Along with ever-increasing capacity for numerical simulation on high performance computing (HPC) and cloud infrastructure, the application of a hybrid technique appropriately matches the problem size with no compromise on accuracy.

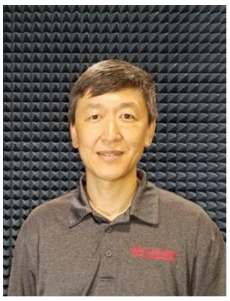
HOST AND MODERATOR

Mr. Dennis Lewis received his BSEE degree with honors from Henry Cogswell College and his MS degree in Physics from the University of Washington. He has worked at Boeing for 32 years and is recognized as a Technical Fellow, leading the enterprise antenna measurement capability for Boeing Test and Evaluation. Dennis holds 10 patents and is the recipient of the 2013 and 2015 Boeing Special Invention Award. He is a member of the IEEE and several of its technical societies including the Microwave Theory and Techniques Society (MTT-S), the Antennas and Propagation Society, and the Electromagnetic

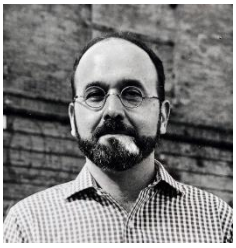
Compatibility (EMC) Society. He serves as a Board Member and is a past Distinguished Lecturer for the EMC Society. He is a Senior Member, served as Vice President on the Board of Directors for the Antenna Measurements Techniques Association (AMTA), and chaired its annual symposium in 2012. Dennis is a part time faculty member teaching a course on Measurement Science at North Seattle College and is chair of the Technical Advisory Committee. His current technical interests include aerospace applications of reverberation chamber test techniques as well as microwave measurement systems and uncertainties.

SPEAKER BIOGRAPHIES

Professor Stuart Gregson has more than twenty five years of experience working in the space, aerospace, and communications sectors and is currently Director of Operations and Research at Next Phase Measurements LLC, and an honorary visiting professor in the School of Electronic Engineering and Computer Science at Queen Mary University of London. He received his BSc degree in Physics in 1994 and his MSc degree in Microwave Solid State Physics in 1995 both from the University of Portsmouth. He received his PhD degree in 2003 from Queen Mary University of London with near-field antenna measurements as his main subject area. Prof. Gregson has developed special experience with near-field antenna measurements, finite array mutual coupling, computational electromagnetics, installed antenna and radome performance prediction, compact antenna test range design & simulation, electromagnetic scattering, 5G OTA measurements and has over 100 peer-reviewed papers on these topics regularly contributing to and organizing industrial courses on these subject areas. At the end of 2007 he was the lead author of a research text entitled, Principles of Planar Near-Field Antenna Measurements, and in 2014 he co-authored a second text, Theory and Practice of Modern Antenna Range Measurements, which is now entering its 2nd edition. He is a Fellow of AMTA, a Fellow of the Institution of Engineering and Technology (IET), a Fellow of the Institute of Physics and is a chartered Engineer and Physicist. In 2018, Prof. Gregson was elected to the AMTA Board of Directors where he is currently serving as Treasurer.



Mr. Zhong Chen is the Director of RF Engineering at ETS-Lindgren, located in Cedar Park, Texas. He has over 25 years of experience in RF testing, anechoic chamber design, as well as antenna and EMC field probe design and measurements. He is currently a board member of Antenna Measurement Techniques Association. He is the Chair of Subcommittee 1 of ANSI ASC C63 which is responsible for EMC antenna calibration and test site validation standards. He is also chair of the IEEE Standard 1309 committee responsible for developing calibration standards for field probes, and IEEE Standard 1128 for absorber measurements. He has served as a Distinguished Lecturer for the IEEE EMC Society. His research interests include measurement uncertainty, time domain measurements, and development of novel RF absorber materials. Zhong Chen received his M.S.E.E. degree in electromagnetics from the Ohio State University at Columbus.



Mr. Jason Bommer is a Lead Application Engineer with Ansys, providing technical support in high frequency electromagnetics (EM) and Radio Frequency Interference (RFI) applications. Jason holds a BS degree in Physics from the University of New Orleans and MS degree in Applied Physics from the University of Washington in Seattle. He has over 20 years of experience developing and applying computational electromagnetic tools to a wide variety of high frequency problems. Prior to Ansys, Jason served as an electromagnetics engineer with Boeing Research and Technology, where he supported multiple programs in the defense, space and commercial business units. He holds publications and patents in sensors, energy harvesting, and nondestructive inspection techniques. Jason is also an adjunct instructor at the School of Industrial Design, Engineering and Art (IDEA) in Tacoma WA, where he teaches physics-based simulation and virtual prototyping.