



IEEE Twin Cities Workshop

Wireless Medical Devices and Systems

The workshop is for engineers and managers interested in learning how to implement wireless technology into medical devices. Attendees will learn processes and approaches used to set requirements, design, test, and manufacture wireless medical systems, including regulatory approval processes. This workshop is a unique opportunity to network with leaders in the field of medical devices.

Agenda:

7:30 A.M. to 8:00 A.M. Breakfast

8:00 A.M. - 8:15 A.M. Opening Remarks & An Overview of the Technical Program

8:15 A.M. – 9:00 A.M. Dr. Donald Witters of the FDA – Challenges and Trends for Wireless Medical Devices

9:00 A.M. to 10:00 A.M. Dr. David Nghiem of Global Wireless Technology (GWT): Reliable and Safe Antenna Systems for Medical Applications: Implant (MICS/SRD/ISM/Bluetooth Low Energy) and (MBAN/BLE) body-worn systems.

10:00 A.M. to 11:00 A.M. Chris Fuller of United Technologies - RF Design for Challenging Environments: RF circuit design issues & solutions for biomedical applications, including wireless implant devices and external communicators.

11:00 A.M. to 12:00 P.M. Tim Oshea of Northwest EMC - EMC and Radio Testing for Wireless Medical Devices: An overview of the requirements that medical devices need to meet in testing for EMC and radio approvals.

12:00 P.M. to 1:00 P.M. Lunch

1:00 P.M. to 2:00 P.M. Dr. Daniel Ewert and Dr. Benjamin Braaten of the North Dakota State University - A Study of Using RF Energy to Pace Cardiac Tissue: Lead-less and battery-less cardiac pacing system.

2:00 P.M. to 3:00 P.M. Dr. David Nghiem and James Kruse of GWT, and Dr. David R. Jackson of the University of Houston - MRI Safety & Compatibility for Wireless Medical Devices: A simple and reliable measurement/numerical modeling methodology that can be used to determine the conservative survivability/SAR/heating scenario.

3:00 P.M. Adjournment

Time: 7 :30 A.M. – 3:00 P.M.

Day: Tuesday

Date: September 29th, 2015

Place: Hampton Inn - 1000 Gramsie Rd., Shoreview, MN 55126

If you have any questions on the technical program, please email Dr. David Nghiem, Chair of TC-MTT_S: TC-MTT@IEEE.ORG.

Brief Speaker Biography

Dr. Donald Witters is a Biomedical Engineer in the Office of Science and Engineering Laboratories, Center for Devices and Radiological Health, Food and Drug Administration. Please visit:

<http://www.fda.gov/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/ucm077210.htm> to review his work on Radio Frequency Wireless Technology in Medical Devices – Guidance for Industry and Food and Drug Administration Staff. **Email:** Donald.Witters@fda.hhs.gov

Dr. David Nghiem is the Founder, President and CEO of Global Wireless Technology (GWT), Inc. He invented many practical antenna technologies for state-of-the-art wireless-communication systems, including medical applications. In addition, he has been developing innovative electromagnetic technologies, including MRI safety/compatibility for medical device and bio-sensor applications, wireless non-far-field power-charging systems, and explosive detection for home-land security and anti-terrorism applications. Dr. David Nghiem has 12 patents. For more information, please visit: <http://www.globalwirelesstechnology.com/prez.html>. **Email:** DNghiem@globalwirelesstechnology.com

Mr. Chris Fuller is an RF design engineer with 27 years of experience designing radios and other circuits for medical implants, cell phones, military radar, security systems, spacecraft, space borne scientific instruments, and other systems. Chris has an undergraduate EE degree from the University of Minnesota - Minneapolis and a master's degree in EE from Johns Hopkins University. Chris is the current vice-chairman of the Twin Cities Microwave Theory and Techniques Society of the IEEE. **Email:** Chris_Fuller@ieee.org

Mr. Tim Oshea is the Minnesota Operations Manager for Northwest EMC, Inc. Northwest EMC is leader in EMC/Radio testing and approvals with locations throughout the United States. He is also a NARTE Certified Engineer, and an active member and current president of the IEEE EMC Twin Cities Section. He has over 30 years of EMC experience, and has enjoyed his career development with Control Data, AMADOR Corporation, TUV Product Service and Medtronic. **Email:** toshea@nwemc.com

Dr. Daniel Ewert has been a Professor of Electrical and Computer Engineering at North Dakota State University, Fargo since 1990. Prior to that he was a research fellow at Mayo Clinic. He has performed cardiovascular engineering research with the US Air Force, NASA, Russian Space Agency, Birmingham Children's Hospital, England, and University of Louisville. He is founder of Krisara Engineering a medical device start-up company. For more information, please visit: <https://www.linkedin.com/pub/daniel-ewert/58/593/698>. **Email:** dan.ewert@ndsu.edu

Dr. Benjamin D. Braaten received the Ph.D. degree in Electrical Engineering from North Dakota State University, Fargo, ND, USA, in 2009. During the 2009 Fall semester, he held a post doctoral research position at the South Dakota School of Mines and Technology, Rapid City, SD, USA. Currently, he is an Associate Professor in the Electrical and Computer Engineering Department, North Dakota State University, Fargo, ND, USA. His research interests include printed antennas, conformal self-adapting antennas, implantable microwave devices, topics in EMC, and methods in computational electromagnetics. For more information, please visit:

https://www.ndsu.edu/ece/people/faculty/braaten_additional_information/. **Email:** benjamin.braaten@ndsu.edu

Dr. David R. Jackson is a Professor in the Department of Electrical and Computer Engineering at the University of Houston, Houston, TX. He has been a Fellow of the IEEE since 1999. His present research interests include microstrip antennas and circuits, leaky-wave antennas, leakage and radiation effects in microwave integrated circuits, periodic structures, and electromagnetic compatibility and interference. For more information, please visit:

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