



Meetings In this Issue:

- May 11: Monday**
Consultants Network (CN)
Topic: Starting A New Business
- May 12: Tuesday**
Photonics Society
Topic: Biophysical Determinants of Photodynamic Therapy and Approaches to Improve Outcome
- May 12: Tuesday**
Consumer Electronics Society (CES)
Topic: 802.11abgn & GPS in the mobile space
- May 14: Thursday**
Instrumentation and Measurement Society
Topic: Wireless USB
- May 19: Tuesday**
Electromagnetic Compatibility (EMC)
Topic: TBD
- May 19: Tuesday**
Communications & Technology (CVT)
Topic: RF IC Design for Cellular Transceiver Front-Ends on Silicon
- May 21: Thursday**
Antennas and Propagation (AP)
Topic: International Broadcasting - Carrying our Radio Beginnings into the 21st Century
- May 26: Tuesday**
Microwave Theory and Techniques (MTT)
Topic: X-parameters – From theory into practice.

IEEE Dallas Section: Direction

May 2009

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From the Chair

By **Larry Zhang**
larryzhang@ieee.org



Dallas section has seen many science and engineering outreach efforts in the last few months. We had a booth at the 2009 Real-Time & Embedded Computing Conference on March 17th at the Richardson Renaissance Hotel. On April 25th, the IEEE Dallas section, the Fort Worth section, and region 5 have staged an IEEE Booth at the Sally Ride Science Festival at SMU. For this particular event, the IEEE table has been visited by several hundred pre-college students, teachers, and parents. At the IEEE region 5 Green conference at Lubbock, the Dallas section has volunteers at the college student robotics competition. Next year the 2010 IEEE Green conference will be in Dallas and Fort Worth, I would encourage more members to support and volunteer. The Dallas regional chamber of commerce has agreed to grant the IEEE Dallas section as one of their associate organizations with several other local high tech promoters and innovators.

This year we also continued our tradition of recognizing outstanding members from IEEE Dallas section who have served our IEEE community at the section and chapter level, have made significant contributions in their field, or have been outstanding speakers for our chapter meetings. We have honored about 20 of our distinguished members on April 25th. The newly elected 2009 IEEE

Fellows and section awardees also received a TI DLP IEEE 125th Anniversary Chip. We appreciate the support from several Tiers who have provided their time and effort to make those TI DLPs and the Support from TI DLP products group's.

We will organize our first senior member upgrade and officer training meeting on May 9th at UTD to provide a venue to exchange ideas among Chapter volunteers and leaders to improve our meeting activities and membership attendance. The senior member upgrade event will help to recognize and elevate our local IEEE members who have contributed to their profession and the industry.

IEEE Dallas section is formed on May 28, 1928 and grown over the last 80 years from a few members to the current over 5000. This involved many people's volunteer efforts in all kinds of ways and capacities. We will continue our tradition and be able to offer more local IEEE activities in the coming months and years.

Larry Zhang
 IEEE Dallas Section
 2009 General Chair

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Dallas Section

Chapter Meetings/Events

Consultant Network (CN)

- Topic:** Starting A New Business
- Date:** Monday, May 11, 2009
- Time:** Social/Networking/Dinner 6:15 pm Program 6:45 pm.
- Location:** Holiday Inn Select,
1655 North Central Expressway,
Richardson, TX
(south of Campbell Road, west side of Central)
- Speaker:** Gary Vick CPA. and Terry Traveland, Corporate Lawyer & Chocolatier
- Cover:** \$5 for IEEE Members, \$15 for non-IEEE Members/Guests (includes light supper buffet) IEEE members who RSVP may bring a guest for a guest charge of only \$5 if they RSVP by the Friday before the meeting. Click the link to RSVP.

Program Description: When you want to start a business, you need answers to many legal and accounting questions. Hear from two experts in these areas so you are prepared with the knowledge you need to start your own business.

Speakers' Biography: Gary Vick CPA. Gary Vick is a Certified Public Accountant with a private practice serving individuals and businesses. His practice is based in Garland, Tx. For more information visit: www.GaryVick.com

Terry Traveland
Terry is now using her experience in working with entrepreneurs and helping them start and grow their business to start her own business.

Photonics Society

- Topic:** Biophysical Determinants of Photodynamic Therapy and Approaches to Improve Outcome
- Date:** Tuesday, May 12, 2009
- Time:** Refreshment 6:00 PM, Program 6:30 PM
- Location:** Photodigm Inc.,
1155 E. Collins Blvd. #200,
Richardson, TX 75083-0938.
Map available at <http://lyle.smu.edu/leos/>
- Speaker:** Dr. Theresa Busch, Department of Radiation Oncology, School of Medicine, University of Pennsylvania
- Cover:** Free

Program Description: Our primary research focus is the investigation of photodynamic therapy (PDT) for the treatment of solid malignancies. PDT involves the local illumination of tumors that have accumulated a photosensitizer following exogenous administration of either the photosensitizer itself or its precursor. The light-excited photosensitizer interacts with oxygen in the treated tissues (tumor) to produce reactive oxygen species that damage the tissue and its associated stroma, including the supporting vascular network. Insomuch as oxygen is a substrate in the photochemical reactions initiated by PDT, it is both required for and consumed by PDT. However, in addition to oxygen consumption by the photochemical process, impairment of oxygen delivery through PDT-created vascular damage, or the simultaneous occurrence of both of these processes can lead to the development of response-limiting hypoxia during therapy. Our

research is centered on defining the intratumor and intertumor distributions of biophysical factors that contribute to PDT response, such as oxygenation, blood flow, photosensitizer concentration and light distribution. Based on our knowledge of PDT-associated heterogeneities in these factors, we devise and test approaches to modulate or monitor them in such a way as to improve therapeutic outcomes.

Speakers' Biography: Dr. Theresa Busch received her Ph.D. in Biophysics in the Roswell Park Cancer Institute Graduate Division, University of Buffalo, State University of NY (SUNY). She completed a postdoctoral fellowship at the University of Pennsylvania, and she is presently a Research Assistant Professor in the Department of Radiation Oncology, School of Medicine, University of Pennsylvania. Dr. Busch has performed extensive research on the biological effects of photodynamic therapy (PDT) on normal and malignant tissues. Her particular research interests include the effects of PDT on tumor hypoxia and blood flow, as well as mechanisms of controlling PDT-created oxygen depletion toward the goal of improving treatment outcome. These interests extend to the clinic, where she has performed studies on photosensitizer uptake and the presence of hypoxia in the tumor and normal tissues of patients to receive PDT. She has a long-standing publication record in these areas, including a number of invited works in the form of reviews, editorials or book chapters. Among her publications, she has had manuscripts chosen as a Featured Article in Clinical Cancer Research and represented on the cover of Cancer Research. In addition to leading an active translational research program in PDT, Dr. Busch served as the Director of the Radiation Oncology Research Seminar Series from 2001-2006. As the director of this series she invited and oversaw the visits of locally, nationally, and internationally renowned guest lecturers in radiation biology or related fields. Currently, she is the coordinator of Cancer Biology, a lecture series for medical residents in radiation oncology. She has mentored many students, ranging from undergraduate to medical level, in PDT-related research projects. She also has served as a member of a special NIH study section assembled to review SBIR/STTR proposals (2002-2003), as well as an ad hoc member of Radiation Study Section. Dr. Busch's laboratory is supported primarily through several NIH grants, including RO1 grant, PDT Effects on Tumor Oxygenation and Blood Flow (PI Busch); Program Project Grant, Photodynamic Therapy for Neoplastic Diseases Involving Serosal Surfaces (PI Glatstein, Project 3 Leader Busch) and an imminent RO1 grant, Oxygen and photosensitizer levels in photodynamic therapy of head and neck tumors (PI Busch).

Website URL: <http://lyle.smu.edu/leos/>

Contact Information: Reddy Urimindi (972) 523-3029 reddyu@ieee.org or Joy Chuang (214) 768-1464 hchuang@lyle.smu.edu

Consumer Electronics (CE)

- Topic:** 802.11abgn & GPS in the mobile space
- Date:** Tuesday, May 12, 2009
- Time:** 11:00am – 11:45am Lunch & networking 11:45am – 12:45pm presentation
- Location:** Dallas Texins Activity Center
13900 North Central Expressway,
Dallas, Texas 75243
Phone: 214.567.3777 (show driver's license to enter)

Program Description: Wi-Fi & GPS location based services are becoming the standard of today's mobile devices, this overview will lightly cover this intensive topic and discuss modern applications of today and in the

Dallas Section

Chapter Meetings/Events

future in this burgeoning field.

Speakers' Biography: William Lumpkins, Senior Member of IEEE, is a Sr. Field application Engineer with Wi2Wi as well as the Lead Consultant at O & S Services, specializing in enabling startup companies to take ideas from concept to reality. He has a Bachelor of Science degree from New York University. William founded the IEEE Dallas Section's Consumer Electronics Chapter in 2004 (www.dallasces.org) and had been selected to serve on the Consumer Electronics Societies ADCom for (2006 ~ 2009). During his time on the IEEE CE Adcom, he was able to lead the CE Team in the creation of the Distinguished Lecturer program, the CE Society Logo, the creation of the Transactions on Haptics, the Transactions on CIS & AI in Games. As the past chair of the ISCE 2007 conference, he was able to bring together CE leaders from around the world to create new ideas and enhance our lives as a community and a society. As a representative of the IEEE Santa Clara Valley Section, he attended and shared cooperative ideas with our IEEE technical leaders at the IEEE Region 6 conferences thus enabling all sections in Region 6 to be able to glean new ideas to increase growth and revenue of all IEEE Societies and sections. William has been able to reach out to top notch industrial and academic resources to speak at Society Chapter and Section level events throughout the year and has met with various Consumer Electronic Society chairs in multiple countries to create cross cultural ties in the CE community.

Instrumentation and Measurement

Topic: Wireless USB

Date: Thursday, May 14, 2009

Time: Social/Networking/Lunch 11:30 AM Program 12:00 PM

Location: Shuiwah Chinese Restaurant,
400 Greenville Avenue,
Richardson, Texas
(South of Arapaho and north of Beltline in the Chinatown Shopping Center)

Speaker: Dr. Jim Lansford

Cover: \$5 for IEEE Members, \$15 for non-IEEE Members/Guests (Includes lunch buffet) IEEE members who RSVP may bring a guest for a guest charge of only \$5 if they RSVP by the Friday before the meeting. RSVP to lynne.patterson@anritsu.com

Program Description: Short-range wireless or personal area networking technology has grown rapidly in the past 5 years, mostly in the form of Bluetooth. While over a billion Bluetooth devices have been sold to date, there are a number of features that could enable new usage models that today's Bluetooth is not well equipped to handle. This talk describes Wireless USB, which is based on ultra wideband (UWB) radio technology. Wireless USB offers speeds of up to 480Mb/s at short distances, and energy efficiency far beyond Bluetooth. WUSB allows exchange of large files such as digital photos, video, and music in seconds, not minutes, and will expend a fraction of the battery capacity compared to Wi-Fi or Bluetooth. The Wireless USB specification was ratified three years ago, with certification and interoperability testing that is sponsored both by USB-IF and independent test labs. A number of WUSB products are already shipping, with many more to launch later this year. This talk will give a look "under the hood" of WUSB and UWB technology, and how it will influence computer, mobile, and consumer electronics products.

Speakers' Biography: Dr. Lansford is Chief Technology Officer of Alereon; he has almost 30 years of experience in communications system

analysis and design as well as digital signal processing. In addition to developing advanced technologies and architectures for future UWB systems, including Alereon's CogniPHY™ technology, he is heavily involved in a number of standards, trade groups, and regulatory activities. Dr. Lansford is formerly Co-chair of IEEE802.15.3a, the High Rate WPAN Task Group, and was also formerly the chair of 802.19 (Wireless Coexistence Technical Advisory Group) within IEEE 802. He was a significant contributor to 802.15.2 and 802.11g. In addition to his technical activities, he is involved in business development activities with strategic partners and key customers. Prior to Alereon, Dr. Lansford was VP of Business Development and CTO of Mobilian Corporation, where he promoted Mobilian's multi-standard radio technology, including advanced interference management techniques. Prior to Mobilian, Dr. Lansford was a Wireless System Architect with Intel Corporation, and was the Co-Chairman of the Technical Committee for the HomeRF Industry Working Group, a wireless technology industry consortium of over 100 companies. In addition to his experience with Alereon and two previous startups, he has served on the teaching and/or research faculty of Georgia Tech, the University of Colorado – Colorado Springs, and Oklahoma State University. He holds several patents and has written articles for journals and trade magazines. He is also currently a Visiting Associate Professor of Electrical Engineering at Texas State University in San Marcos.

Dr. Lansford received his Ph.D. in Electrical Engineering from Oklahoma State University in 1988, his M.S. in Electrical Engineering from the Georgia Institute of Technology in 1982, and his B.S. in Electrical Engineering, with highest honors, from Auburn University in 1980.

Electromagnetic Compatibility (EMC)

Topic: TBD

Date: Tuesday, May 19, 2009

Time: Refreshments 6 - 7 PM, Meeting at 7 PM

Location: Holiday Inn Select

Speaker: TBD

Cover: Free

RSVP: Bob Queen BQDude1@tx.rr.com

Website URL: www.DallasEMC.org

Contact Information: Joe Stanfield Joe.stanfield@ieee.org
Bob Queen BQDude1@tx.rr.com

Communications & Technology (CVT)

Topic: RF IC Design for Cellular Transceiver Front-Ends on Silicon

Date: Tuesday, May 19, 2009

Time: 11:30 am – 1 pm

Location: Holiday Inn Select,
1655 N. Central Expressway,
Richardson, TX

Speaker: Fikret DÜLGER, Senior RF IC Design Engineer, Microtune Inc. Plano, TX

Cover: No cost for meeting. Lunch is \$5 for IEEE members; \$10

Dallas Section

Chapter Meetings/Events

for non-members

Program Description: Deep submicron Digital CMOS technology has become the technology of choice in Radio Frequency IC implementations for multi-band, multi-mode Cellular Systems owing to its lower cost due to the possibility of integration with the digital circuitry (DSP, memory, etc.) on the same die and to its ease of programmability. This choice is making the design of RF front-end building blocks of transceivers challenging. In the first part of this talk, some of these challenges will be pointed out and addressed within the context of two Receiver Front-Ends designed in 90nm Digital CMOS. The first design is a GSM/GPRS/EDGE (GGE) receiver front-end for GSM850 Band. With a low power of 46mW, it achieves 31dB gain, 2.1dB integrated noise figure, 5dB of noise figure under blocking condition and -9.5dBm of in-band IIP3. The second design example is a Dual Mode Receiver for DCS Band. It uses direct conversion for WCDMA mode and 100 kHz low IF for GGE mode. No inter-stage SAW filter is used between the LNA and the mixer. The receiver has a NF of 2.9dB and meets all the out of band and in-band linearity requirements for both WCDMA and GGE modes.

In the second part of the presentation, the design and characterization of an important building block in a W-CDMA transmitter, the Single-Sideband (SSB) Modulator will be treated. The performance of the SSB Modulator has an important effect on both the linearity and noise of the transmitter. The high degree of amplitude variation in the W-CDMA signals requires very high linearity in the transceivers. Another important challenge is the TX noise at the receive band due to the full FDD (frequency-division duplex) nature of the transceiver, meaning both the TX and the RX are on at the same time. Some measurement results associated with the SSB modulator of a W-CDMA transceiver designed and implemented in a 0.18 μ m SiGe BiCMOS technology will conclude the talk.

Speakers' Biography: Fikret Dülger received the B.S. and M.S. degrees in electronics from Istanbul Technical University (ITU), Istanbul, Turkey, in 1993 and 1996, respectively, and the Ph.D. degree in electronics from Texas A&M University, College Station, in 2002. He was a Research Assistant with the Electronics and Communication Engineering Department, Istanbul Technical University, from 1993 to 1996. In 1994, he was a Design Engineer with the ETA ASIC Design Center, Istanbul, developing full-custom mixed-mode industrial ASICs. In the 1998 and 1999 summer terms, he worked in the RF IC Design Group, Texas Instruments Incorporated, Dallas, TX, as a Design Engineer for his internships. He was a graduate student and Research and Teaching Assistant in the Department of Electrical Engineering, Texas A&M University, between Fall 1996 and Spring 2002. From January 2002 to February 2009, he worked as a Design Engineer in the RF IC Design Group, Texas Instruments Inc.. He is currently a Senior RF IC Design Engineer with Microtune Inc., Plano, TX. In addition to being coauthor of numerous scientific papers in international journals and conferences, he is coauthor of a book titled Integrated RF Building Blocks for Wireless Communication Transceivers (Saarbrücken, VDM Verlag Dr. Mueller, 2008) based on his doctoral dissertation. His research and professional interests are in the area of analog circuit design for RF integrated circuits.

Website URL: www.cvt-dallas.org

Contact Information: Traci King Traci.king@us.fujitsu.com

Antennas and Propagation (AP)

Topic: International Broadcasting - Carrying our Radio Beginnings into the 21st Century

Date: Thursday, May 21, 2009

Time: Lunch buffet starts at 11:15 am, program at 12:00 noon

Location: Pasand Indian Cuisine
1377 West Campbell Road,
Richardson, TX, 75080
(972.644.4447) (Southeast corner of Coit and Campbell)

Speaker: Mr. Paul Lynus, Continental Electronics

Cover: \$5. For more information please visit us on the web at <http://ieeedallas-aps.org>.

Program Description: Paul Lynas will present a brief history and the current state of the art in international high frequency (HF) broadcasting. The presentation will include the unique design challenges to operating at very high radio frequency (RF) power levels including aspects of building a large broadcast site with high gain antennas for distant listeners. Today's transmitters are very much integrations of RF and computer systems, but the transmitters have unique challenges of handling very high-level voltages, current, and RF fields. With the movement of the world's broadcasters into digital techniques of orthogonal frequency division multiplex (OFDM) familiar to the cell phone, compact disk (CD) quality reception is possible. A few sound clips received in Dallas from New Zealand will show the possibilities.

Speakers' Biography: Paul Lynas received degrees in Physics and in Electrical Engineering from Lamar University in Beaumont Texas in 1968 and 1974, respectively. Actively involved in development of antennas and transmitter systems since 1972, he is a principal engineer with Continental Electronics in Dallas. With specialties in RF generation and radiating systems at very high energy to 600 kW and above, he has been instrumental in the design and development high power RF systems, including broadcast systems installed world-wide.

Microwave Theory and Techniques (MTT)

Topic: X-parameters – From theory into practice.

Date: Tuesday, May 26, 2009

Time: Lunch 11:30 AM / Program 12:00 noon

Location: Shuiwah Chinese Buffet
400 N Greenville Ave #11
Richardson, TX 75081 (972) 907-8868

Speaker: Graham J. Riley, David E. Root PhD.

Cover: Mandatory \$5 (\$10 for non-IEEE members). Includes admission and buffet. No charge for Student and Life Members. PLEASE BRING YOUR IEEE CARD TO RECEIVE THE REDUCED OR FREE PRICING.

RSVP: csanabria@tqs.com by noon, May 22nd, for restaurant headcount.

Program Description: During 2008 X-parameters (1) made their way from theoretical possibility into the practical world of measurement and modeling. The release of Agilent's NVNA and additions to Agilent's ADS simulation environment made it possible to characterize amplifiers with X-parameters and import these measurements into a PHD model and use them for simulation. In December 2008 at the European Microwave show a Load Pull based X-parameter measurement setup was shown by Maury and Agilent which opens the door for device level modeling. This overview presentation will look at X-parameters from three main perspectives:

Why X-parameters? A brief retrospective on non-linear behavioral modeling and the reason for the development of the X-parameter measurements and the PHD model.

Using X-parameters today. A look at test equipment and methods that can measure X-parameters and at how X-parameters can be used for modeling in a simulation environment.

X-parameters – what comes next? A few thoughts on the current state of

Dallas Section Chapter Meetings/Events

play and how things might develop going forward.

(1) Non-authoritative general reference <http://en.wikipedia.org/wiki/X-parameters>

Speakers' Biography: **Graham Riley** has over 20 years experience in the use and application of Analog, RF and Microwave EDA software. He began his career as a designer and program manager at GEC-Marconi Research Centre and Cossor Electronics (Raytheon). In 1993, Graham joined EEsof Inc. and after the acquisition of EEsof Inc. by the Hewlett Packard Company, transferred from the UK to Richardson, Texas as part of the HP-EEsof team. In 2000, he joined the sales management team for the Agilent EEsof program and in 2001 became the Business Development Manager for their Modeling Systems and Software business in the US. In 2002 Graham joined Accent Optical Technologies Inc. as Director of Marketing for their DiVA product line. He

returned to Agilent in late 2003 as an EEsof Application Specialist in the Texas Area. Graham received his BSc (Hons.) in Communication Engineering from Plymouth University and his MSc in Microwaves and Modern Optics from University College London.

Dr. David E. Root received B.S. degrees in physics and mathematics, and, in 1986, the Ph.D. degree in physics, all from MIT. He is presently Principal Research Scientist and Modeling Architect at Agilent Technologies' High Frequency Technology Center in Santa Rosa, CA. His current responsibilities include nonlinear behavioral and device modeling, large-signal simulation, and nonlinear measurements for new technical capabilities and business opportunities for Agilent. David was elected IEEE Fellow in 2002. He was 2006-2008 IEEE MTT-S "Distinguished Microwave Lecturer." David received the 2007 IEEE ARFTG Technology Award "for contributions to nonlinear RF and microwave device measurement and behavioral modeling." In 2008, David

IEEE Dallas Section: Officers Training and Senior Member Upgrade Event

- Date:** Saturday, May 9th 2009
Time: 11:00 am to 3pm
Location: University of Texas at Dallas, Richardson Campus
2601 North Floyd Road
Richardson, Texas 75080
Venue: TI Auditorium, ECSS building
Parking: <http://www.utdallas.edu/campusmap.html>
- Schedule:** 11:00-12:00: Officers training (Current and future officers)
12:00-1:00: Pizza and networking
1:00-3:00: Senior member Upgrade event

Please RSVP by email to
Rajan, Dinesh rajand@engr.smu.edu
IEEE Dallas Section ViceChair



The Dallas Section of the Institute of Electrical and Electronic Engineers (IEEE) for the benefit of its members publishes *Direction* monthly from September through May. Articles, special announcements and information for publication should be submitted to William Lumpkins (xillia@ieee.org) The deadline for submission of materials is no later than the 20th of the month prior to the month of publication.

Advertising: *Direction* is distributed to approximately 7,200 members in the Greater Dallas area. Invoicing and/or contractual agreements for advertising are administered by William Lumpkins, Administrative Chairman and Mark Swenholt, Treasurer, IEEE Dallas Section. All ad insertions must be cleared through the executive board before publication. Advertising rates are as follows:

Per Insertion

Full Page \$800.00
Half Page \$400.00

Quarter Page \$200.00
Bus. Card \$120.00

Dallas Section

Chapter Information

Aerospace and Electronic Systems (AES)

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Program Chair:	Chris Pilcher	(972) 952-3183
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Secretary / Treasurer:	Mark Gober	(972) 205-4752
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Antennas and Propagation (AP)

Website: <http://www.ieeedallas-aps.org/>

Chair:	Mr Narindra Nath Lakhanpal	(972) 387-9243
	narindra_lakhanpal@hotmail.com	

Circuits and Systems (CAS)

Website: <http://ewh.ieee.org/soc/cas/dallas/>

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	sudhind@ti.com	
Vice chair:	Mak Kulkarni	(214) 567 5144
	mak@ti.com	
Publicity Chair/Secretary:	Arjun Rajagopal	(214) 480-2752
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Program Chair:	Bhaskar Bannerjee	(972) 883-6459
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Past Chair:	Liming Xiu	(214) 480-4930
	limingxiu@ti.com	

Communications & Technology (CVT)

Website: <http://www.cvt-dallas.org/>

Chair	Steve Maxwell	(972) 250-1289
	smaxwell@wt.net	

Computational Intelligence (CI)

Chair:	Dingding Chen	(972) 418-3472
	Dingding.Chen@Halliburton.com	
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Organization Chair:	Orlando De Jesús	(972) 418-3078
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Computer (C)

Website: <http://chapters.computer.org/dallas/>

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Program Chair:	Jim Bondi	
Web Chair:	Jim Bondi	

Consultants Network (CN)

Website: <http://www.ieeedallascn.org/>

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Vice Chair:	Mike Hallett	(972) 394-0714
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Consumer Electronics (CE)

Website: <http://www.dallasces.org/>

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Vice Chair:	Mike Hannah	(214) 480-1087
	m-hannah@ti.com	
Treasurer:	Anuradha Sundararajan	(214) 293 2537
	sanuradha@ti.com	
Secretary:	Adolfo Echeverria	(972) 742-7579
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Education (E)

Past Chair	William M. Riley	(214) 478-4065
	bill@billrileys.com	

If you are interested in volunteering/becoming an officer for this society, please contact the past chair, William Riley.

Electromagnetic Compatibility (EMC)

Website: <http://www.dallasemc.org/>

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Vice Chair - Education	Ron Moser	(972) 278-3133
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Electron Devices (ED)

Chair	Zeynep Celik-Butler	(817) 272-1309
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Engineering in Medicine and Biology (EMBS)

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Secretary & Workshops/Conference:	Dinesh Bhatia, PhD	(972) 883-2386
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Communications Committee Chair:	Richard Fincher	(214) 616-2844
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Corporate and Professional Relations Chair:	Dennis Goldsberry	(972) 690-1922
	d.goldsberry@ieee.org	
Academic Relations Committee Chair:	Khosrow Behbehani	(817) 272-2249
	kb@uta.edu	
Technical and Educational Outreach Chair:	Harry Tibbals	(214) 648-3316
	harry.tibbals@utsouthwestern.edu	
Membership Development Committee Chair:	Bill Diong, PhD	(817) 257-6317
	b.diong@tcu.edu	
Executive Committee Member:	Elisabeth Marley	(214) 768-1891
	emk@ieee.org	

Engineering Management (EM)

Chair:	Bob Bishop	(903) 482-5320
	r.bishop@ieee.org	

Microwave Theory and Techniques (MTT)

Dallas Section Chapter Information

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