

# The Valley Megaphone

Newsletter of the  
**Institute of Electrical and  
Electronics Engineers, Inc.,  
Phoenix Section**  
September 2013,  
Volume XXVII, Number 9



## Executive Committee 2013

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### Membership

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IEEE Phoenix Section on-line updates can be found at  
<http://ewh.ieee.org/r6/phoenix/> and on LinkedIn  
at:<http://www.linkedin.com/groups?gid=2765918>

Please send announcements for the *Valley  
Megaphone* to Mahesh Shah at [mkshah@ieee.org](mailto:mkshah@ieee.org)  
for inclusion in the Section Calendar.

The IEEE Banquet pictures are up, see  
<http://ewh.ieee.org/r6/phoenix/index.php>

**All meetings announced in the  
Phoenix Section Megaphone or on  
the Phoenix Section Calendar are  
open to everyone (IEEE members  
and non-Members)**

## Chapters

### Signal Processing & Communications

Pavan Turaga  
[pturaga@asu.edu](mailto:pturaga@asu.edu)

### Computer Society

Jerry Crow  
[jerry.crow@computer.org](mailto:jerry.crow@computer.org)

### CPMT Society

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### Education Chapter

Martin Reisslein, 480-965-8593  
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### EMBS Chapter

TBD

### EMC Society

Harry Gaul, 480-441-5321  
[harry.gaul@ieee.org](mailto:harry.gaul@ieee.org)

### GOLD

Shafiul "Jacky" Islam 520-245-9010  
[shafiul.islam@intel.com](mailto:shafiul.islam@intel.com)

### Power & Energy Society

Kory Hedman  
[Kory.Hedman@asu.edu](mailto:Kory.Hedman@asu.edu)

### Solid State Circuits

Cyndi Recker  
[cyndi.recker@ieee.org](mailto:cyndi.recker@ieee.org)

### Teacher-In-Service

Rickie Currens  
[Rickie.Currens@att.net](mailto:Rickie.Currens@att.net)

### Waves & Devices Society

Steve Rockwell  
[steve.rockwell@ieee.org](mailto:steve.rockwell@ieee.org)

### Life Members

Les Daviet II  
[lesdavietii@cs.com](mailto:lesdavietii@cs.com)

### Women In Engineering

Shamala Chickamenahalli  
[shamala.chickamenahalli@intel.com](mailto:shamala.chickamenahalli@intel.com)

## **U – News**

**(for Student Members)**

### **Updates of Student Advisors and Committee Members**

Each Student Branch noted on the right side of this page should review current information on Advisors and Student Committee Members and forward to my attention within this week, as we are reviewing contacts for reporting and activities including Student Monthly Meetings.

S. Diane Smith  
602-749-4601  
[sdianesmith@computer.org](mailto:sdianesmith@computer.org)  
Student Activities Chair

## **Student Branches**

**ASU Main, Engineering**  
Chair: Ahmet Durgun,  
480-371-7743, [adurgun@asu.edu](mailto:adurgun@asu.edu)  
Advisor: Cihan Tepedelenlioglu,  
480-965-6623, [cihan@asu.edu](mailto:cihan@asu.edu)

**ASU Main, Computer Society**  
Chair: TBD  
Advisor: Guoliang Xue  
480-965-6218, [xue@asu.edu](mailto:xue@asu.edu)

**ASU Polytechnic**  
Chair: TBD  
Advisor: TBD

**DeVry, Phoenix**  
Chair: Lori Renaldi  
[lorirenaldi@computer.org](mailto:lorirenaldi@computer.org)

Advisor: Diane Smith  
[dsmith2@devry.edu](mailto:dsmith2@devry.edu)

**DeVry, Computer Society**  
Chair: TBD  
Advisor: Diane Smith  
[dsmith2@devry.edu](mailto:dsmith2@devry.edu)

**NAU, Engineering**  
Chair: TBD  
Advisor: Niranjan Venkatraman  
[v.niranjan@ieee.org](mailto:v.niranjan@ieee.org)

**Embry-Riddle, Prescott**  
Chair: Lisa M. Ferguson  
[FERGUSL2@my.erau.edu](mailto:FERGUSL2@my.erau.edu)  
Advisor: John E. Post  
[postj@erau.edu](mailto:postj@erau.edu)

## **U – Newsbytes**

**ASU Polytechnic is currently seeking Advisor for the Student Branch. Please email Diane (at email address above) with Recommendations.**

Start your own MicroMouse and compete for cash prizes!

The Section has a full tournament sized MicroMouse maze. Funding for your project may be available. For details contact the Section Student Activities Chair, S. Diane Smith  
[sdianesmith@computer.org](mailto:sdianesmith@computer.org)

- View pictures from the MicroMouse contest at the Southwest Area Spring 2010 meeting at <http://picasaweb.google.com/ieeegoldphx/2010IEEEESWASpringMeeting> (photography by David Huerta, GOLD Affinity Group Chair)

## 2013 IEEE Phoenix Section Region 6 Southwest Area Award Winners

**Outstanding  
Educator**  
**Dr. Stephen  
Goodnick**  
**Arizona State  
University**



**Outstanding  
Engineer**  
**Dr. John Parsey**  
**ON Semiconductor**



**Outstanding Small  
Student Branch**  
**Embry-Riddle  
Aeronautical U.**  
**Ms Lisa Ferguson (l)**  
**Ms Emily Davy (r)**



**Presenter: Mark Frankfurth, San Diego Section**



## **Upcoming Conferences in August in Region 6**

This is the end of summer and the climate is hot and humid in Arizona now.

There are only 13 conferences in the entire Region 6 for the IEEE. Nine are in California, one in Oregon, one in Washington State, and two in Nevada.

If you know of any upcoming conferences, please submit the information to [Bradscientist@ieee.org](mailto:Bradscientist@ieee.org), IEEE Phoenix Conference Chair.

# Signal Processing & Communications Society

Phoenix Chapter of IEEE Signal Processing Society and  
Communications Society



## From Human Vision to Computer Vision: Innovations and Inventions

*Co-sponsored by SPCOM chapter, SenSIP Center, IVU Lab*

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In recent years, computer vision has emerged as a catalyst for great advances in consumer products such as smartphones, TVs, and cars. In this talk, we will start by highlighting different examples of product innovation using computer vision algorithms and technology. The rest of the presentation will be spent on sharing a framework to identify computer vision inventions and patents from both academia and industry.

**Location:**

Building: Goldwater Center (GWC)  
Room Number: 487  
ASU Main Campus  
Tempe, Arizona  
United States

[Click here for Map](#)

**Date:** 23-September-2013

**Time:** 11:00AM to 12:00PM (1.00 hours) **All times are:** MST

**Speaker:**



**Khaled El-Maleh** of Qualcomm

**Topic:** From Human Vision to Computer Vision: Innovations and Inventions

**Biography:** Khaled El-Maleh (kemaleh@qualcomm.com) received his M. Eng. and Ph.D. from McGill University, Canada, and B. Sc. in EE and B. Sc. in Applied Math from King Fahd University (KFUPM), Saudi Arabia. He has been with Qualcomm, San Diego since 2000. Dr. El-Maleh's areas of expertise and interests include: design, implementation and quality evaluation of mobile multimedia systems with focus on speech and video compression/processing algorithms, computer vision, data mining/analytics, innovation and technology transfer. He was a key member of the team who designed the first generation of mobile camcorder and video telephony solutions for both UMTS and CDMA networks. He was the video quality lead for Qualcomm chip unit and contributed to the design of media quality assessment tools. He is currently leading the multimedia & user experience engineering team in the Strategic IP Department of Qualcomm developing innovative technologies to enhance mobile multimedia user experience. He is also leading Qualcomm User Experience IP Strategy team. In addition to his technical publications, he has filed more than 200 US and international patents covering video\image\speech processing and compression technologies, mobile learning and wireless power charging.

He is a founding member of the International Workshop on Quality of Multimedia Experience (QoMEX) and served as the General Co-Chair for QoMEX 2009. He recently served as the TPC Vice Chair (Tutorial Co-Chair) for Globecom 2010, TPC member for ACM Multimedia 2010, Steering Committee vice-chair of QoMEX workshops, Industry Co-Chair for ICME 2011, Industry Chair for SiPS 2011, Industry Panel Co-Chair of ACM Multimedia 2011, Advisory Committee member of IEEE DSP/SPE 2011, a member of the steering committee of ICME 2010-2012 representing the communications society, Industry Co-Chair for ICIP 2012, Special Sessions Co-Chair for MMSP 2012, Tutorials Chair for ICASSP 2013, General Co-Chair of ICNC 2013 and 2014. He was a guest editor of two special journal issues on Quality of Multimedia User Experience (IEEE Signal Processing Magazine and EURASIP Journal on Image and Video Processing) - published in 2011. He is an associate editor for EURASIP Journal on Image and Video Processing. He is a member of the industry advisory board of Florida International University School of Computing and Information Sciences.

**Email:** [kemaleh@qualcomm.com](mailto:kemaleh@qualcomm.com)



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC.



IEEE COMPONENTS, PACKAGING AND  
MANUFACTURING TECHNOLOGY SOCIETY

## IEEE Components, Packaging and Manufacturing Technology Society - Phoenix Chapter

Wednesday, September 18, 2013 at 6 PM

GaN based Power Devices – Fact and Fiction

Dr. Michael A. Briere

### ABSTRACT

Recently, much attention has been given to the advent of commercially viable GaN based power devices, due to the inherent advantage in specific on-resistance and terminal capacitances, as well as the essential absence of minority carriers in their switching behavior. A review is provided of the nature of GaN based power devices, with a focus on the AlGaIn-GaN based high electron mobility transistor (HEMT). A comparison of the construction and performance of GaN based HEMTs to state of the art silicon based MOSFETs and IGBTs is presented. Data dispelling several myths that have propagated about the limitations of lateral GaN HEMTs using silicon substrates will be examined. Examples of the advantages provided by GaN based HEMTs in a variety of power conversion applications such as dc-dc and ac-dc converters and motor drive inverters are discussed. The ability of such lateral devices to process more than 1000 A/cm<sup>2</sup> is demonstrated. A brief discussion of the complementary role of GaN and SiC based devices in the marketplace is provided. The potential implications of low cost, high performance power electronics enabled by the widespread adoption of commercialized GaN based power devices on world wide energy consumption will be discussed.

### BIOGRAPHY

**Michael A. Briere** is the Executive Scientific Consultant and principal of ACOO Enterprises LLC. Previously, he was Executive Vice President Research & Development, and Chief Technology Officer of International Rectifier. He has served as the technical lead for IR's GaN based power device technology platform development program since 2005. Dr. Briere was also founder, President, and Chief Executive Officer of Picor Corporation, a developer and marketer of innovative power-IC designs and systems and Corporate Chief Scientist for ON Semiconductor. He has worked on semiconductor materials development and characterization at IBM, MeV/u ion-solid interactions and radiation effects in solids at the Hahn Meitner Institute of Berlin and the interaction of highly charged ions (e.g. Th 80+) with solid surfaces at Lawrence Livermore National Laboratory, as well as power IC technology development at Cherry Semiconductor.

Dr. Briere has a BSEE and MS in Physics from Worcester Polytechnic Institute, and a Doctorate in Solid State Physics from the Technical University of Berlin. He has served as an Adjunct Associate Professor of Physics at the University of Rhode Island and on the program committee for the International Symposium for Power Semiconductor Devices and ICs.

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**Date:** Wednesday, September 18<sup>th</sup>, 2013

**Location:** Group Conference Room, Freescale Semiconductor, Inc., 2100 E. Elliot Rd. Tempe, AZ. There are new signs on the property (Discovery Business Center). Enter the facility through the Main (South) Lobby in building 94 and sign in with Security. You will be escorted to the meeting room.

**Time:** 5:30–6:00 Social/Refreshments, 6:00–7:00 Presentation, 7:00 Dinner  
(Pizza and Soda will be provided by the IEEE CPMT Phoenix Chapter)

IEEE members and non-members are all welcome to attend. Those who plan to attend should be at the facility entrance no later than 6:00 pm, as there will be no escorts available after that.

**Next Meeting – Wednesday, October, 16<sup>th</sup>, 2013 – Topic will be announced later**

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**For more information, please contact any of the following CPMT officers:**

Vasu Atluri (480) 227-8411

Devrajan Balaraman

Vivek Gupta (480) 252-8493

Mahesh Shah (480) 544-9438

David Dougherty (480) 413-6923

Surinder Tuli (480) 554-

## Power & Energy Society



IEEE Power and Energy Society  
Phoenix Chapter

<http://ewh.ieee.org/soc/pes/phoenix/>



### News and Announcements:

- Want to know more about IEEE Power and Energy Society? Watch this video:
  - [http://www.youtube.com/watch?v=BRKM4lpo\\_tk](http://www.youtube.com/watch?v=BRKM4lpo_tk)
  - More videos are available at:  
<http://ieee-pes.org/outreach/pes-informational-promotional-videos>
- Have you considered becoming a Senior Member of IEEE? It's not as difficult as you think. Basically, you need ten years of professional experience, and your bachelor's degree counts for three of those years. Find out more at:  
[http://www.ieee.org/membership\\_services/membership/senior/index.html](http://www.ieee.org/membership_services/membership/senior/index.html)

### September 2013 Luncheon Meeting

Date: Thursday, September 19, 2013  
Time: 11:30 am - 11:45: Registration  
11:45: Lunch  
12:15 pm: Program  
Location: SRP PERA Club  
1 E Continental Dr  
Tempe, AZ  
Map: <http://ewh.ieee.org/soc/pes/phoenix/images/PERAMAP.pdf>  
Speaker: Mahesh Morjaria, Ph.D., VP, Global Grid Integration, First Solar  
Topic: The Role of Utility-Scale PV Plants in Grid Stability & Reliability  
Cost: \$5.00 (No cost if you are a college student)  
Reservations: Contact Nicole at (602) 470-0400 or submit your name here:  
<http://ewh.ieee.org/soc/pes/phoenix/lunch.php>  
The reservation deadline is NOON on Monday, September 16, 2013.



# Solid State Circuits Society



INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS



***New Updates coming soon***

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SSCS-PHX Chapter Website: [http://www.ieee.org/go/sscs\\_phx](http://www.ieee.org/go/sscs_phx)

Contact: Cyndi Recker (cyndi.recker@ieee.org), SSCS-PHX Chapter Chair

# **EMC Society**



***New Updates coming soon***



## Phoenix Section Life Member Affinity Group

### Technical Meeting October 15, 2013

**Topic:** "Guide to the Markets" presented by Ben Kunzler with 15 minutes of Economic update, 15 minute Market update, and Q&A session.

**Speaker Bio:**

Ben Kunzler is a Vice President/Client Advisor with JPMorgan Asset Management. In 2002, Ben went to work for UBS as a Financial Advisor and consultant for the Intel Stock Option account for greater Arizona. In 2003, Ben joined ING Funds in Scottsdale AZ as a mutual fund consultant for the Midwest region. In 2005, Ben began working for JP Morgan Asset Management, and has been working with Financial Advisors in Arizona, Colorado and New Mexico since 2008.

Ben has presented to thousands of Financial Advisors and Clients across the country, sharing investment insights, market and economic insights, as well as business-building and marketing strategies. He is frequently a guest speaker at many professional conferences. He holds his series 7, 63 and 65.

Ben, and his wife Jenn, have 2 young children, James and Aubrey, and reside in Mesa, Arizona.

**When:** Tuesday, October 15, 2013 11:00am – 1:00pm, Registration fee is \$15. This fee will include lunch provided by the PERA Club.

#### LIFE MEMBER AFFINITY GROUP MEETING

**Where:** SRP's **PERA Club** Bighorn Room,  
1 East Continental Drive, Tempe, AZ  
West of 68th St., 1/2 mile south of McDowell Road

**RSVP:** Please respond to Program Chair, Ronald Sprague by email: [r.sprague@ieee.org](mailto:r.sprague@ieee.org) at least 5 days before the meeting.

The Program Chair is seeking suggestion from members for future presentations. Any ideas of interest to LM are open for consideration. Please contact Ronald Sprague Program Chair at [r.sprague@ieee.org](mailto:r.sprague@ieee.org) or any officer with ideas.

#### About IEEE Phoenix Section Life Member Affinity Group:

The IEEE Phoenix Section Life Member Affinity Group was organized to enable IEEE Life Members to retain active IEEE associations, contribute to the social good in their communities, advance IEEE's professional interests and enjoy each other's company. For more details use the link

[http://www.ieee.org/web/volunteers/mga/home/life\\_members\\_committee/index.html](http://www.ieee.org/web/volunteers/mga/home/life_members_committee/index.html)

**Activities:** Annual technical meetings scheduled in February, May, October, and December. Elections are held at the December meeting.

#### Future Technical Meetings:

- Tuesday, October 15, 2013 SRP PERA CLUB
- Tuesday, December 3, 2013 SRP PERA CLUB

#### Officers:

|            |                    |  |
|------------|--------------------|--|
| Chair      | Leslie Daviet II   | <a href="mailto:lesdavietii@cs.com">lesdavietii@cs.com</a>             |
| Vice Chair | Michel Ebertin     | <a href="mailto:Michel@ebertin.net">Michel@ebertin.net</a>             |
| Secretary  | Tom Lundquist      | <a href="mailto:Tom.Lundquist@ieee.org">Tom.Lundquist@ieee.org</a>     |
| Treasurer  | Leslie Daviet II   | <a href="mailto:lesdavietii@cs.com">lesdavietii@cs.com</a>             |
| Program    | Ronald L. Sprague, | <a href="mailto:r.sprague@ieee.org">r.sprague@ieee.org</a>             |
| Past Chair | A. Barry Cummings  | <a href="mailto:abarrycummings@gmail.com">abarrycummings@gmail.com</a> |



IEEE Phoenix Section  
Women in Engineering  
Affinity Group



IEEE Phoenix Section **Women in Engineering (WIE) Affinity Group (AG)** will be representing WIE at the Arizona State University (ASU) Engineering Career Exploration Night on ASU's Tempe Campus on September 10, 2013, from 4:00 to 8:00 pm on the second floor of the Memorial Union. This unique event specifically targets students in their first year of engineering study. The event is focused on helping new engineering students learn about the many facets of engineering and learn from real engineers. Several WIE members participated in this event the last two years and found the experience both fun and rewarding. Volunteers for this year's event are needed, so please contact any member of the Executive Committee (listed below) if you are interested in participating.

If you would like to be added to our distribution list for further information about this and future events, please contact Diane Watkins ([diane.watkins@srpnet.com](mailto:diane.watkins@srpnet.com)).

If you would be interested in helping to organize any of our activities or have suggestions for other activities or speakers for future events, please feel free to contact any of our Executive Committee members:

- Chair: Shamala Chickamenahalli ([shamala@ieee.org](mailto:shamala@ieee.org))
- Vice-Chair: Joy Harris ([joyelle.j.harris@intel.com](mailto:joyelle.j.harris@intel.com))
- Secretary / Publicity: Diane Watkins ([diane.watkins@srpnet.com](mailto:diane.watkins@srpnet.com))
- Treasurer: Diane Smith ([diane@web-oasis.com](mailto:diane@web-oasis.com))
- Web Master: Audrey Skidmore ([ASkidmore@azmag.gov](mailto:ASkidmore@azmag.gov))
- Membership: Lesley Polka ([lesley.a.polka@intel.com](mailto:lesley.a.polka@intel.com))
- Region 6 Liaison: Barbara McMinn ([barbara.mcminn@aps.com](mailto:barbara.mcminn@aps.com))

The IEEE WIE Affinity Group's mission is to inspire, engage, encourage and empower IEEE women worldwide with a vision of creating a community of IEEE women and men innovating the world of tomorrow. More information about IEEE WIE can be found at: [http://www.ieee.org/membership\\_services/membership/women/women\\_about.html](http://www.ieee.org/membership_services/membership/women/women_about.html).

## Computer Society



### Phoenix Chapter of the IEEE Computer Society

September, 2013

#### News

- Planning continues for the chapter meetings for the remainder of the year. We have confirmed speakers for both of the remaining meetings this year, September and November.
- We are beginning to assemble our programs for 2014. Tentative 2014 chapter meeting dates are listed below. Mark your calendars to save the dates:
  - January 8<sup>th</sup> at DeVry University
  - March 5<sup>th</sup> at ITT-Tech
  - May 7<sup>th</sup> at DeVry University
  - July 2<sup>nd</sup> at ITT-Tech
  - Sep 3<sup>rd</sup> at DeVry University
  - Nov 5<sup>th</sup> at ITT-Tech

Details of the program for these chapter meetings will be published as the speakers are confirmed.

#### Future Events

- September 12th (**note date change, this is a Thursday**) – Chapter meeting, DeVry University, speaker Brad Morantz, PhD, "**More Than an Overview of Data Mining or How Did They Know All That About Me?**"

There is much in the news these days about data collections performed in the name of security. This presentation will speak to the mathematics and science behind the analysis of that data and why so-called "data mining" is a very powerful tool for gleaning specific information from the vast quantities of data that are collected on a daily basis.

Data from observations contain correlations between the variables. Things do not just happen at random. There is an order to the universe. If we can learn what the data is trying to tell us, then we have allowed the data to tell us the story. In this time of plentiful and cheap memory, data is voluminous.

This presentation begins with some definitions and covers the basic types and classifications of data-mining, as well as some typical applications and uses. Methodology and mathematics explaining the process will be described. A few brief examples will be used to demonstrate the process. The subject could easily (and often does) require a two to three semester course, so this presentation will introduce the subject and point out areas to investigate further.

Dr. Morantz has a BS in CIS and EE, a MS and PhD in Decision Science, a mixture of mathematical science, psychology, and computer science. He has post graduate studies in Computational BioScience, Computer Science, Statistical Design Methodology, and Design Analysis Simulation Experiments (DASE).

Dr Morantz has published and presented on neural networks, multiprocessing mathematics, biologically inspired computing architecture, and data mining. His current research is in autonomous intelligent systems, also called machine-cognition.

He is currently tech fellow for Prime Solutions Group of Phoenix AZ. He is also on the editorial board of the International Journal of Data Mining, Modeling, and Management. In the IEEE, Dr Morantz is a senior member, the Vice-Chair of the Phoenix Computer Society, and Conference Chair.

- November 6<sup>th</sup> – Chapter meeting, ITT Technical Institute, officer elections for 2014; speakers Lori Renaldi and Jerry Crow, “**PEN Testing Techniques using Open Source Tools**”. Details available soon.
- January 8<sup>th</sup> – Chapter meeting, DeVry University, possible topic on robotics and/or artificial intelligence.

Meetings start at 6:00 pm with networking and light refreshments followed by the presentation at 7:00 pm. DeVry University is located at 2149 W Dunlap Avenue, Phoenix, (a mile east of I-17 on Dunlap). ITT-Tech is located at 5005 S Wendler Drive, Tempe (NW corner of I-10 and Baseline Rd).

Visit the CS Chapter website for the latest information: <http://ewh.ieee.org/r6/phoenix/compsociety/>. For brief announcements regarding upcoming events we are also on Twitter: @IEEECS\_PHX

Election of chapter officers for 2014 will take place at the November meeting. If you would like to volunteer to serve in one of the officer positions please contact one of the chapter officers.

If you would like to suggest a topic or speaker for any of our future meetings, please contact one of the chapter officers:

|                      |  |
|----------------------|--|
| Chair:               | Jerry Crow ( <a href="mailto:jerry.crow@computer.org">jerry.crow@computer.org</a> )    |
| Vice-chair:          | Brad Morantz ( <a href="mailto:bradscientist@ieee.org">bradscientist@ieee.org</a> )    |
| Secretary/Webmaster: | Audrey Skidmore ( <a href="mailto:askidmore@computer.org">askidmore@computer.org</a> ) |
| Treasurer:           | Diane Smith ( <a href="mailto:sdianesmith@computer.org">sdianesmith@computer.org</a> ) |



*Meeting Free & Open to Non-IEEE Members*

*6:00 to 7:00PM, Tuesday, September 17, 2013*

**Agilent Offices, 4330 West Chandler Blvd, Chandler**  
*(East side of Stellar Business Center Office Park)*

## The Mechanism of Loss in Modern Microwave Dielectric Materials

**Nate Newman**

**Lawrence Professor of Solid State Sciences, Arizona State University**

### Abstract

Miniaturization of satellite communication and cellular systems requires low-loss temperature-compensated microwave materials with enhanced dielectric constants. Despite the practical importance of achieving a small  $\tan \delta$ , a fundamental understanding of what physical mechanism determines this important parameter has not been firmly established. In this talk, I review my group's work using modern experimental and theoretical condensed matter methods to understand the intrinsic and extrinsic factors involved in optimizing practical dielectrics and our efforts to make high performance tunable materials.

The properties of commercial dielectrics are often optimized by adding magnetic dopants or alloying agents, such as Ni or Co to adjust the  $\tau_r$  to zero. At low temperatures, we show that the dominant loss mechanism in these commercial materials comes from spin excitations of unpaired transition-metal d electrons in isolated atoms (light doping) or exchange coupled clusters (moderate to high doping), a mechanism differing from the usual suspects. We show that we can suppress this loss mechanism using magnetic fields, allowing us to markedly increase the quality factor of such dielectrics to values as high as  $5 \times 10^5$  at 10 GHz and tune their signal output. We describe our efforts to take advantage of this effect at sufficiently high temperatures and small enough magnetic fields for practical applications.

1. Microwave loss in the high performance dielectric  $\text{Ba}(\text{Zn}_{1/3}\text{Ta}_{2/3})\text{O}_3$  at 4.2K, Lingtao Liu, Marco Flores and Nathan Newman, *Phys. Rev. Letters* **109**, 257601 (2012).
2. The dominance of paramagnetic loss in microwave dielectric ceramics at cryogenic temperatures, Lingtao Liu, Alena Matusevich, Chirag Garg and Nathan Newman, *Appl. Phys. Lett.* **101**, 252901 (2012).

### Biography

Nate Newman is now serving as the Lawrence Professor of Solid State Sciences at Arizona State University. His research interests focus on the investigation of novel solid-state materials for microwave, photonic and high-speed applications. Current work involves synthesis, characterization and modeling of novel superconductor junctions and materials, III-N semiconductors for spintronic applications, low loss dielectrics for microwave communication, and novel earth abundant photovoltaic material. He has been author or co-author of over 200 technical papers, has 11 patents and his papers have been cited over 5,000 times. He has received the IEEE Van Duzer award and became a Fellow in the American Physical Society in 2006. He also serves as Editor for Materials in the IEEE Transactions of Applied Superconductivity and directed the Center of Solid State Science at Arizona State University from 2004-2011.

**Date:** Tuesday, September 17th, 2013

**Time:** 6:00 PM *Presentation*, Pizza will be served following the Seminar

**Location:** [Agilent Office, Suite 367, 4330 West Chandler Blvd., Chandler AZ 85226](#)

(In Stellar Business Center on North side of Chandler Blvd west of McClintock Rd.)

For more information, contact:

Steve Rockwell (WAD Chapter Chair)

(480) 241-9891

[steve.rockwell@ieee.org](mailto:steve.rockwell@ieee.org)

Vishwanath Natarajan (Chapter Publicity)

(404) 428-0514

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**WAD Website:** <http://ewh.ieee.org/r6/phoenix/wad/>



## **Ionic Memory - Hype or Reality?**

**Michael N. Kozicki, Ph.D., C.Eng.,**

### **Abstract**

It is generally accepted that the adoption of novel materials and device structures will be required to overcome the limitations of charge-storage memory elements as we pass beyond the “1X nm” node of the International Technology Roadmap for Semiconductors (ITRS). This is particularly true in the case of non-volatile memory (NVM), where both NOR and NAND Flash will struggle to meet the requirements of next generation memory due to the dwindling number of stored electrons in their highly scaled cells. One solution to this problem involves devices that can be switched between two or more non-volatile resistance states. One of the most promising resistance-change random access memory or RRAM variants is ionic memory. A thin ion-conducting film is placed between two electrodes to form a device which may be switched by the rapid formation of a nanoscale conducting pathway created by ion transport and redox reactions. Ionic memory technology would appear to have all the necessary attributes for applications in high density non-volatile arrays and data storage. The memory cells are scalable and may be operated at low voltage and current, thereby minimizing power dissipation in high density integrated systems and allowing their use in energy-starved mobile devices. Both transistor-based multi-level cell (MLC) active and diode-isolated passive cells have been successfully demonstrated, pointing the way to mass storage applications, and NOR-functionality devices have already been commercialized. This talk will present the state-of-the-art in nanoionic memory materials, devices, and arrays. It will cover where the technology currently lies and where it is likely to go in the not-too-distant future, including other areas in which the use of compact low energy resistance switching elements is desirable.

### **Biography**

Michael Kozicki is a Professor of Electrical Engineering at Arizona State University and is a founder of ASU spin-out companies Idendrix, Inc. and Axon Technologies Corp. He holds over 75 highly-ranked US and international patents and, is a frequent invited speaker at major international conferences. His work in solid state ionics has led to a new class of memory which is currently available on the world semiconductor market. He previously served as Chief Scientist of Adesto Technologies Corp., Founding Director of Entrepreneurial Programs in the Ira A. Fulton Schools of Engineering, Director of the Center for Solid State Electronics Research (CSSER) at ASU, and Adjunct Professor at Gwangju Institute of Science and Technology in Korea. He graduated from the University of Edinburgh, where he is currently a Visiting Professor. Dr. Kozicki is a Chartered Engineer, a Founding Member of the Globalscot Network, and a member of several organizations, including the IEEE and the Institute of Physics.

**Date:** **Thursday, Oct. 10th , 2013**

**Location:** [Arizona State University, Brickyard on Mill, 6<sup>th</sup> Floor, Room BYeng-660](#)

699 S. Mill Ave. Tempe, AZ 85281

Best parking is underground. Take elevator at west end of parking area up to 6<sup>th</sup> floor.

**Time:** **5:00 PM Presentation, Pizza will be served following the Seminar**

For more information, contact:

Steve Rockwell (WAD Chapter Chair)

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[steve.rockwell@ieee.org](mailto:steve.rockwell@ieee.org)

Vishwanath Natarajan (Chapter Publicity)

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**WAD Website:** <http://ewh.ieee.org/r6/phoenix/wad/>





# IEEE GOLD

## Phoenix Section Affinity Group



### IEEE GOLD Phoenix Section Officers:

- Chair: Shafiul “Jacky” Islam (shafiul.islam@intel.com)
- Treasurer: Ashley Meredith (ashley.meredith@aps.com)
- Webmaster: Joseph Caglio (joseph.m.caglio@intel.com)

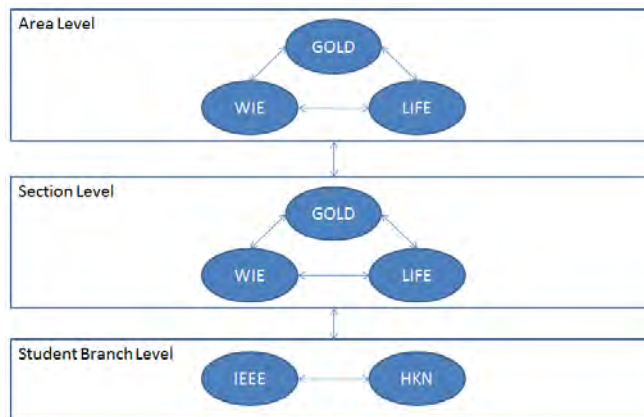
On August 24, at the Region 6 Southwest Area Meeting held at Hilton Phoenix Airport (2435 S 47th St Phoenix, AZ 85034), Jacky, Ashley, and Joseph introduced a brief summary of their background to the IEEE community. Jacky presented the chapter report, plans for upcoming events, and proposed an initiative—IEEE GOLD Strategic Alliance.

### Upcoming events (being planned):

- Presentation Workshop: Speaker from Intel Corporation
- Your Journey: Six speakers share their personal and/or professional journey
- Professional member recruitment: IEEE-Eta Kappa Nu (IEEE-HKN)

### IEEE GOLD Strategic Alliance:

- Purpose: Increase synergy, reach, and networking
- Mission: Maximize Engagement
- Vision: A standard global culture for all irrespective of demographics for integration of talents and skills for advancement of humanity through technology.
- The Big Picture:



- Benefits for IEEE:
  - L31 for Event Organizers
  - L31 for Event Collaborators
  - Increased activity of organizational units (and survivability)
- Benefits for Corporations:
  - Recruitment
  - Brand promotion
  - Products and services promotion
- Secrets to bridging gaps (increase synergy, reach, and network):
  - Discovering and reaching other people
  - Creating linkages that are mutually beneficial
  - Learning from each other
  - Growth opportunities
- Conclusion:
  - IEEE GOLD SWA and Phoenix Section are helping young professionals become more successful by increasing knowledge, synergy, reach, and network.
  - IEEE GOLD Alliance is going to create win-win situation for all.



## 2013 IEEE Phoenix Section News

View or down load the pictures from IEEE Phoenix Section Annual Banquet 2013 at: <http://ewh.ieee.org/r6/phoenix/index.php>

### Executive Committee Meeting

Tuesday, September 3, 2013, 5:45 – 8:00 PM  
The Airport Hilton Phoenix,  
2435 S 47th St. Phoenix, AZ 85034, (480) 894-1600.  
Next Meeting October 1, 2013

### Executive Committee Meetings

**Date:** First Tuesday of every month, except July and August

**Time:** 6:00 – 8:00 p.m.

**Location:** Hilton Phoenix Airport, 2435 South 47th Street, Phoenix, AZ 85034

### 2014 IEEE Phoenix Section Annual Banquet

IEEE Phoenix Section Annual Banquet on Saturday, February 8th, 2014 at Hilton Phoenix Airport, 2435 South 47th Street, Phoenix, AZ 85034 (Tel: 480-804-6008). Award nomination forms and Student Scholarship Applications will be available by September 30th, 2013. Banquet registration will be open from Wednesday, January 1st, 2014 until Wednesday, February 5th, 2014. Please access <http://sites.ieee.org/phoenix> for forms and registration. For additional information, please contact Vasu Atluri at [vpatluri@ieee.org](mailto:vpatluri@ieee.org) and (480) 227-8411 (Cell), Chuck Weitzel at [c.weitzel@ieee.org](mailto:c.weitzel@ieee.org) and (480) 292-0531 (Cell), and Barbara McMinn at [Barbara.mcminn@aps.com](mailto:Barbara.mcminn@aps.com) and (602) 371-6383.

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### Phoenix Section LinkedIn Group

If you are interested in professional networking and shared Section related updates & discussions join the [IEEE Phoenix Section Group on LinkedIn](#). Signing up only takes minutes and is free. A job board is available as well.

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## IEEE Phoenix Section Ventures Into Social Media

We have made good progress in our Facebook page so far.

We have 43 people who Like this page (subscribers). Our first goal is to reach 500 likes by end of this year.

The activity chart shows that between 100 to 160 people are accessing this page every week.

You can access the web page three ways:

Use the URL: <https://www.facebook.com/IEEEPhoenixSection>

Click on the Facebook logo link from IEEE Phoenix section home page. <http://sites.ieee.org/phoenix/>

Search for IEEE Phoenix Section from your Facebook page.

We need following help.

1. Each of you access the IEEE Phoenix Section Web page and click on "Like" hyperlink.
2. Go on the Friends section of the page and "Invite Your Friends." Once you click on Invite button, it will get your email contact list. Your facebook contact list will already be populated with your Facebook friends and you can simply click the Invite button next to their name. Please invite as many friends as you can.
3. Provide me the contents for posting on a regular basis - meeting/ event announcements, Event pictures, Videos.
4. Start some discussion topics under - Status section.

If you have any questions, please call me.

Thanks for your help in advance.

I will send out regular reminders as well to make sufficient progress.

Vivek Gupta  
Pace Chair  
IEEE Phoenix Section

480-734-0266

## **IEEE Phoenix Section Nomination of Officers**

The IEEE Phoenix Section is seeking nominations for the following elected Section officer positions for the 2014 term:

- Chair
- Vice Chair
- Secretary
- Treasurer

Additionally, the Nominating Committee is seeking candidates for some of the following non-elected appointed standing committee Chair positions for the 2014 term:

- Publicity
- Membership
- Student Activities
- Conferences
- Awards
- Inter-Society
- PACE (Professional Activities Committees for Engineers)
- TISP (Teacher In-Service Program)
- Web Master

Section officers must be IEEE members. Self-nominations are acceptable.

Please send nominations or any questions to Ralph Hogan @ [rhogan@ieee.org](mailto:rhogan@ieee.org).  
Section members are urged to submit your nominations by no later than October 1, 2013.  
Sincerely,  
Ralph Hogan  
Chair, Nominating Committee,

# 56th IEEE-PES FUNDRAISER GOLF TOURNAMENT



## November 2, 2013 in Rio Verde, AZ

Be sure to join us at Rio Verde Golf Club, located at 18731 E 4 Peaks Blvd, Rio Verde, AZ 85263, for a 1:00 PM Shotgun Start. The course is located 10 Minutes north of Fountain Hills. (480) 471-9420 <http://www.rioverdecc.com/Map>

This is the annual fundraiser for your IEEE-PES Chapter. The fee is \$100 per player or \$400 to sponsor a foursome. Be sure to come early and stay late as there will be free range balls beforehand and dinner afterwards. Cash prizes awarded for first place, second place, and third to last place teams. There will also be a Raffle, Skills Games, and Giveaways Galore.

Use this sheet to sign up either individually or for your team. You can either:

- Print out and complete, then mail the form with your payment
- Return this form electronically ([insidesales@youngpower.com](mailto:insidesales@youngpower.com)) and then send your payment.
- Send payments to: IEEE-PES  
c/o Young Power  
7505 E Greenway Road  
Scottsdale, AZ 85260

You will be notified via email that your payment has been received and you are registered to participate. If you have any questions, please feel free to call us at (480) 991-9191.

Please provide all requested information, including email addresses for all team members.

TEAM/SPONSOR \_\_\_\_\_

Player \_\_\_\_\_ Dinner? \_\_\_\_\_

Email \_\_\_\_\_

Player \_\_\_\_\_ Dinner? \_\_\_\_\_

Email \_\_\_\_\_

Player \_\_\_\_\_ Dinner? \_\_\_\_\_

Email \_\_\_\_\_

Player \_\_\_\_\_ Dinner? \_\_\_\_\_

Email \_\_\_\_\_

Additional Dinner Guests: \_\_\_\_\_

To minimize waste and extra costs, we would like your help getting an accurate dinner count.

## IEEE Membership Grade Advancement

IEEE Phoenix Section Executive Committee encourages all to apply for advancement in membership grade to Senior Member and Fellow Grade. Please review the requirements at [www.ieee.org](http://www.ieee.org). Please contact IEEE Phoenix Section Membership Development Chair, Dr. Vasudeva P. Atluri, at [vpatluri@ieee.org](mailto:vpatluri@ieee.org) for additional information.

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### Enhanced Senior Member Application Launched

Effective 29 July 2011, IEEE Admission and Advancement launched a [new Senior Member Application](#). The new application includes numerous enhancements, based on feedback from volunteers and members, including:

- New user friendly format / design
- Secure environment (need IEEE Web account)
- Ability to save application in “draft” form
- Ability to upload resume or Curriculum Vitae (up to 3 MB)
- Applicant can view application online
- Applicant can view status of requested reference forms
- References will be notified by email to provide applicant reference
- References will have the ability to view their completed reference form(s)
- Real time application status

The goal is to provide prospective Senior Members with an easy to use and intuitive interface, while streamlining internal operations at the same time. [View the new Senior Member application](#).

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## IEEE USA E Book on Transition

### IEEE-USA E-Book E-Books to Members in September and October Feature

**Career Survival and Writing for Success:** IEEE-USA is offering two free e-books to IEEE members the next two months as a special benefit of IEEE membership. In September members can receive “The Best of IEEE-USA Today’s Engineer on Career Survival.” In October, the free featured publication will be “Writing for Success -- An Engineer’s Guide, Volume 1: Designing for Success.” “The Best of Today’s Engineer on Career Survival” is a compilation of career-focused articles from “IEEE-USA Today’s Engineer” that can help you find success in a challenging job market. We all need the ability to survive in a changing world, and engineers need a better awareness about the evolving business ecosystem and what those changes mean. The articles in this e-book will help to increase your situational awareness of the marketplace, which in turn, can help you with career planning and developing sustainable job skills. You’ll also learn how to assess the market and yourself, how to stay competitive, and what steps to take to thrive in the job market. “The Best of Today’s Engineer on Career Survival” can be downloaded at <http://www.ieeeusa.org/communications/ebooks/files/wisao2sf/Best-of-TE-On-Career-Survival-V1.pdf> for free to IEEE members. The nonmember price is \$5.99. The purpose of “Writing for Success -- An Engineer’s Guide, Volume 1: Designing for Success” is to inspire and help engineers to approach their writing tasks with the same confidence and skill they take to the technical problems that confront them -- so that emails, reports, test-plans, and other documents they write are as useful, successful and valued as their engineering efforts. “Writing for Success – An Engineer’s Guide, Volume 1: Designing for Success” will be available for members to download in October.