# The Valley Megaphone

Newsletter of the
**Institute of Electrical and Electronics Engineers, Inc.**
**Phoenix Section**
May 2005, Volume XIX, Number 5

## Executive Committee

**Past Chair**
George Karady, 480-965-6569
karady@asu.edu

**Chair**
Shamala Chickamenahalli, 480-554-6774
shamala@ieee.org

**Vice-chair**
Rao Thallam, 602-236-5481
rsthalla@srpnet.com

**Secretary**
Rao Bonda, 480-413-6121
r.bonda@ieee.org

**Treasurer**
Dongming He, 480-552-0947
dongming@ieee.org

**Publicity**
Eric Palmer, 480-554-8710
ecpalmer@ieee.org

**PACE**
Mike Andrews, 480-991-1619
m.andrews@ieee.org

**Membership**
Mark Garula, 602-436-4031
mgarula@ieee.org

**Student Activities**
Keith E. Holbert, 480-965-8594
holbert@asu.edu

**Conferences**
Henning Braunisch, 480-552-0844
**braunisch@ieee.org**

**Awards**
Vasudeva P. Atluri, 480-554-0360
vpatluri@ieee.org

## *This Issue of The Valley Megaphone Features:*

### *Contacts:*



### *Contents:*



IEEE Phoenix Section Executive Committee meeting minutes can be found at: http://www.ieee.org/phoenix

## Executive Committee

**Inter-Society**
Mike Andrews, 480-991-1619
m.andrews@ieee.org

**Web Master**
Chandan K. Das, 480-554-1300
cdas@ieee.org

## Chapters & Branches

**Communication & Signal Processing**
Cihan Tepedelenlioglu, 480-965-6623
cihan@asu.edu

**Computer Society**
Bob Bianca, 623-582-1700
bob.bianca@ieee.org

**Consultants Network (PACN)**
Vaughn L. Treude, 602-750-3662
vaughn@nakota-software.com

**CPMT Society**
Ravi Sharma
ravi.sharma@microchip.com

**EMC Society**
Harry Gaul, 480-441-5321
harry.gaul@ieee.org

**Power Engineering Society**
Steven Clark, 480-661-8599
steveclarkpower@earthlink.net

**Waves & Devices Society**
Chuck Weitzel, 480-413-5906
Chuck.weitzel@freescale.com

**GOLD**
Peter Cioe, 480-441-1702
pcioe@ieee.org

The Valley Megaphone is the newsletter of the Phoenix Section of the Institute of Electrical and Electronics Engineers. It is published monthly, usually September through June. The publication reaches about 4000 members. Submit articles, advertisements, and announcements to Eric Palmer at the above email address. Deadline for announcements and advertisements is the third Friday of the month prior to publication.
Advertising Rates: Full page: $200, 3/4page: $125, ½ page: $75, 1/3 page: $50, 1/4 page: $25. Change of address/email? Call toll free 1-800-678-IEEE. Please allow 6-8 weeks. Section Web Page is: http://www.ieee.org/phoenix

## Student Branches

**ASU Main, Engineering**
Chair: Sanam Nassirpour
sanam.nassirpour@asu.edu
Advisor: Cihan Tepedelenlioglu, (480) 965-6623
Cihan@asu.edu

**ASU Main, Computer Society**
Chair: Muhammad Shaukat Lodhia
shaukat@asu.edu
Advisor: Joseph Urban, 480-965-3374, joseph.urban@asu.edu

**ASU East, Technology**
Chair: Curtis Ritter
emceeiii@aol.com
Advisor: Dr. Raji Sundararajan, 480-727-1507 Raji@asu.edu

**DeVry, Phoenix**
Chair: Sarah Mahoney,
sarah_mahoney@juno.com
Advisor: Dion Benes, (602) 870-9222, dion.benes@phx.devry.edu

**DeVry, Computer Society**
Chair: Mike Lewis
Mike_Lewis@ieee.org
Advisors: Terri Barnes, 602-870-9222 tbarnes@devry-phx.edu, Diane Smith 602-870-9222, dasmith@devry-phx.edu

**NAU, Engineering**
Chair: Cari Fischer
cdf5@dana.ucc.nau.edu
Advisor: Peter Blakey, 928-523-3493
Peter.Blakey@nau.edu

**NAU, Computer Society**
Gabriel Brewer
rgb7@dana.ucc.nau.edu
Advisor: Phil Mlsna, 928-523-2112
Phillip.Mlsna@nau.edu

**Embry-Riddle, Prescott**
Advisor: Chuck Cone
conec@erau.edu

**Embry-Riddle Computer Society**
Advisor: Susan Gerhart, (928) 777-3882
gerharts@erau.edu

# The Intel International Science and Engineering Fair

### CALL FOR GRAND AWARD JUDGES

Please consider this a formal invitation to participate as a Grand Award Judge in one of the following categories of computer science, engineering (mechanical, chemical, electrical, industrial), math, physics and other categories for the Intel Science and Engineering Fair (ISEF) in 2005.

### CALL FOR GRAND AWARD JUDGES

Phoenix will be the site of the Intel International Science and Engineering Fair (ISEF) to be held May 8-14, 2005. This fair is the 56th annual competition among the top high school (pre-college) students **worldwide** and includes support from Arizona's government, the three state universities, the community college system, corporations, and medical institutions. This event provides an opportunity for over 1200 of the best young minds to demonstrate their innovative ideas, display projects, and compete for over $3 million in scholarships and awards in 14 different categories.

**We need your assistance to make this event a success!** We need over 1200 grand award judges to volunteer 2 days of their time ( May 10 & 11, 2005) to examine projects, interview students, and ultimately select the grand award winners. Although 2 days is a significant commitment of professional time, this experience will be well worth it. Judges find their discussions with these enthusiastic students to be most uplifting, as they play an important role in encouraging many of the future science and engineering leaders of tomorrow. We invite you to sign up online to be a judge in computer science, engineering (mechanical, chemical, electrical, industrial), math, physics and other categories by going to www.intelisef2005.org

Click on judges and follow the prompts. This site also contains additional information about the fair.

Participation in this event is guaranteed to be a rewarding experience for all involved! I look forward to working with those who are able to volunteer for this event. Please let me know the response from the system after you provide your information into the category of judging at the website above.

Sincerely,

Dr. Shamala Chickamenahalli
Intel Corporation
Phone: 480-554-6774
e-mail: Shamala.chickamenahalli@intel.com

IEEE COMPUTER SOCIETY

# Using UML 2.0 to Model and Develop Software Systems

## **SPEAKER:** Harry Koehnemann
## **DATE: 6:00 PM, Wednesday May 4, 2005**

**LOCATION: DeVry University**, 2149 West Dunlap Ave, Phoenix, Az 85021 (1 mile east of I-17 on Dunlap, SE corner of 22nd Ave and Dunlap). Networking will be in the Courtyard (6-7PM with light meal), presentation at 7PM.

**Free, Everyone is welcome.** Please tell others about this meeting.

The Unified Modeling Language (UML) has received much press with the recent release of UML 2.0. Harry shows the value of modeling systems and how system aspects are modeled using UML. He presents the most significant the UML notation and diagrams, emphasizing those features new to UML 2.0. He also discusses future modeling trends and model driven development made possible by UML 2.0 and related specifications.

Dr. Harry Koehnemann is an Associate Professor in the Division of Computing Studies at Arizona State University where he performs research and teaching in the areas of distributed software systems, software process, and modeling. Before joining ASU in 2001, Harry spent several years as a Software Architect and Senior Software Developer developing large, distributed web-based systems. Harry is also an active consultant and has performed work in object technology and systems development to organizations including General Dynamics, Motorola, Intel, Unicon, Ameritech, and Orbital Sciences. Harry received his Ph.D. in Computer Science from Arizona State University in 1994.

See www.ieeecs.com, for more information.
Contact Bob Bianca (Bob.Bianca@Computer.Org)

**June 8** – Gary Mastin (Lockheed Martin IS&S) – Digital Image Processing

IEEE COMPUTER SOCIETY

# Digital Image Processing

## SPEAKER: Gary Mastin

## DATE: 6:00 PM, Wednesday June 8, 2005

**LOCATION: DeVry University**, 2149 West Dunlap Ave, Phoenix, Az 85021 (1 mile east of I-17 on Dunlap, SE corner of 22nd Ave and Dunlap). Networking will be in the Courtyard (6-7PM with light meal), presentation at 7PM.

**Free, Everyone is welcome.** Please tell others about this meeting.

Digital image processing has found broad utility, especially in engineering and scientific endeavors. Gary Mastin will provide insight into how digital image processing has been applied to interesting problems from his work at Sandia National Laboratories and at Lockheed Martin. Among the applications to be presented will be the analysis of launch imagery associated with the Space Shuttle Columbia disaster.

Dr. Gary Mastin is a principal engineer with Lockheed Martin IS&S in Goodyear, Arizona, where he is an algorithm development lead. Gary has considerable experience in synthetic aperture radar (SAR) image formation and parallel architectures for signal processing. Prior to working for Lockheed Martin, Dr. Mastin worked at Sandia National Laboratories in Albuquerque, New Mexico. He was part of a small Sandia team that provided digital image processing consulting across the laboratories. Sandia applications included shock physics, accelerator physics, nuclear weapons safety, physical chemistry, and a few unique activities with the FBI and Defense Intelligence Agency.

See www.ieeecs.com, for more information.
Contact Bob Bianca (Bob.Bianca@Computer.Org)

**Fall:** Wednesdays September 14, October 12, November 9, December 14

# MAY MEETING ANNOUNCEMENT FOR THE PHOENIX EMC CHAPTER

**Date:** Wednesday, May 25th, 2005
**Place**: Garcia's Mexican Restaurant at Embassy Suites Hotel
**Address:** 4400 South Rural Road, Tempe, Arizona
**Address:** Just South of U.S. 60 on West side of Rural Rd.
**Time:** 5:00PM Social, 6PM Dinner (order off menu), 7PM Meeting and Presentation
**Title:** Understanding and Avoiding EMC Problems of LANs
**Speaker**: Dr. Heyno Garbe, University of Hannover, Germany

**Abstract**: The increasing use of high-speed data transmission has resulted in much discussion about the real or mythical interference from these new systems. Some people claim a lot of problems with Power Line Communication (PLC) as a prime example. Other people that deal with ISDN or DSL systems have never experienced any EMC related problems. Europeans claim that shielded cables are the only safe way to transport the data. What's right and what's wrong? This talk may give answers to these questions. First some EMC fundamentals with respect to LANs will be presented. The goal is that through the use of some simple equations, one will understand and avoid EMC problems. Then the discussion will address the EMC effects of typical mistakes like improper installation or mechanical damage. Finally, the EMC properties of modern LANs will be presented.

**About the Speaker:** Dr. Heyno Garbe received his Dipl.-Ing. and Dr.-Ing. degree in Electrical Engineering from the University of the Federal Armed Forces, Hamburg, Germany, in 1978 and 1986, respectively. Currently he is a Professor at the University of Hannover, Germany. In 1986 he joined Asea Brown Boveri Research Center, Switzerland. There he was involved in research activities on TEM-waveguides, the numerical calculation of electromagnetic fields, and other EMC related topics. Since 1992 he has been with the University of Hannover where he holds a professorship in the faculty of electrical engineering and computer science. He has developed an active research program related to electromagnetic field effect modeling, testing, and measurement as applied to EMC. Professor Garbe is also very active in several EMC related national and international standardization committees. He has authored and co-authored more than one hundred articles in books, journals and conferences.

**RESERVATIONS:** Please call Daryl or Mary at Kimmel Gerke Associates in Mesa AZ at 480-755-0080. (If no answer, please leave a voice mail.) You may also register by email at dgerke@emiguru.com. There is no charge for meetings, but you pay for your own meal and drinks. Since we order off the menu, we do not need an exact number, so if you decide at the last minute, please come anyway. You don't need to be an IEEE or EMC Society member to attend -- all are welcome.

## IEEE PACN May Meeting

**PACN Annual Picnic**: This year it will be on **Saturday, May 14** at Lane Garrett's home. It will start at about 2:00 with dinner at 5:00 and networking until dusk. Lane's address is **8502 East Cactus Wren Road, Scottsdale, Arizona**. IEEE PACN will provide the main course and sodas; you can bring whatever else. We hope to see you there.

**WAVES AND DEVICES PHOENIX CHAPTER**

**May 4, 2005 – EDS Meeting**
**www.eas.asu.edu/~wadweb**

IEEE WAVES AND DEVICES CHAPTER
WAD
MTTS - EDS - APS - LEOS - UFFCS

IEEE

# *Large-Signal Operation of Microwave AlGaN/GaN Field-Effect Transistors (HFET's)*

**R. J. Trew, PhD**
ECE Department
North Carolina State University
Raleigh, N.C.

**Abstract**

Recent developments in wide bandgap semiconductor devices provide the opportunity to design and fabricate microwave transistors that demonstrate performance previously available only from microwave tubes. The most promising electronic device for RF power applications is an HFET fabricated using the AlGaN/GaN heterojunction. These devices can sustain bias voltages significantly in excess of what can be applied to standard semiconductor devices, and AlGaN/GaN HFET's have demonstrated RF output power density on the order of 10-12 W/mm of gate periphery when biased at Vds=40v, and over 30 W/mm when biased at Vds=120v. The AlGaN/GaN HFET's should produce useful performance well into the mm-wave region, and potentially as high as 100 GHz. However, the high voltage operation of these devices introduces a variety of physical effects that currently limit RF performance, linearity, and device reliability. Also, an IMPATT-mode operation of these devices has been discovered under high voltage operation, and this mode has implications for practical utilization of these devices. This presentation will focus upon the RF large-signal operation of these devices, with an emphasis upon the physical effects associated with various charge trapping, surface, and space-charge phenomena that affect the RF performance of these devices. Engineering approaches to controlling these performance limiting effects will be discussed.

Robert J. Trew received the Ph.D. degree from the University of Michigan in 1975. He is currently the Alton and Mildred Lancaster Professor of Electrical and Computer Engineering and Head of the ECE Department at North Carolina State University, Raleigh. From 1997-2001 he was Director of Research for the U.S. Department of Defense, with management oversight responsibility for the $1.3 billion yearly basic research programs of DoD. Dr. Trew served as Vice-Chair of the U.S. Government interagency committee that planned the U.S. National Nanotechnology Initiative (NNI). Dr. Trew is a Fellow of the IEEE, and was the 2004 President of the Microwave Theory and Techniques Society. He was Editor-in-Chief of the *IEEE Transactions on Microwave Theory and Techniques* from 1995 to 1997, and from 1999-2002 was founding Co-Editor-in-Chief of the award winning *IEEE Microwave Magazine*. Dr. Trew has twice been named an IEEE MTT Society Microwave Distinguished Lecturer, and is currently serving his second term in this capacity. Dr. Trew has received numerous awards. He has over 140 publications, 15 book chapters, and has given over 340 technical presentations. Dr. Trew has seven patents.

**Date: May 4, 2005 Location: Arizona State University, Main Campus, Goldwater Center (GWC) Room 487**
See http://www.asu.edu/map/b2.html for more details.

**<u>Time</u>: 5:30-6:00pm Social/Refreshments, 6:00-7:00pm Presentation, 7:00pm Dinner (Pizza & soda are being provided by the WAD Phoenix Chapter)**

For more information, please call Chuck Weitzel (Chapter Chair) at (480) 413-5906.