

The Valley Megaphone

Newsletter of the
**Institute of Electrical and
Electronics Engineers, Inc.,
Phoenix Section**
February 2011,
Volume XXV, Number 2



Executive Committee - 2010

Chair

Jim Hudson, 480-855-8987
jim.hudson@srpnet.com

Vice Chair

Ralph Hogan, 480-774-8227
rhogan@ieee.org

Secretary

Charles Weitzel, 480-292-0531
c.weitzel@ieee.org

Treasurer

Russ Kinner, 602-997-2353
r.kinner@ieee.org

Past Chair

Henning Braunsch
480-552-0844

braunsch@ieee.org

Publicity

TBD

PACE

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

Membership

TBD

Student Activities

Nick Leonardi,
480-736-1970 x23
nleonardi@ieee.org

Conferences

TBD

Awards

Vasudeva P. Atluri
480-227-8411
vpatluri@ieee.org

Inter-Society

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

Webmaster

Henning Braunsch
480-552-0844
braunsch@ieee.org

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IEEE Phoenix Section on-line updates can be found at:
<http://www.ieee.org/phoenix> and on LinkedIn at:
<http://www.linkedin.com/groups?gid=2765918>
Please send announcements for the *Valley Megaphone*
to Satish Ayer at satish.ayer@ieee.org and to Russ
Kinner at r.kinner@ieee.org for inclusion in the Section
Calendar.

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

Chapters

Signal Processing & Communications

David Frakes, 480-727-9284
dfrakes@asu.edu

Computer Society

Jerry Crow
jerry8128@gmail.com

Consultants Network (PACN)
TBD

CPMT Society

Vasudeva P. Atluri
480-227-8411
vpatluri@ieee.org

Education Chapter

Martin Reisslein, 480-965-8593
reisslein@asu.edu

EMBS Chapter

TBD

EMC Society

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

GOLD

David Huerta
huertanix@ieee.org

Power & Energy Society

Naim Logic, 602-236-3838
nlogic@ieee.org

Solid State Circuits

Mohamed Arafa
mohamed.arafa@ieee.org

Teacher-In-Service

Mike Poggie
mike.poggie@ieee.org

Waves & Devices Society

Steve Rockwell
steve.rockwell@ieee.org

Life Members

Barry Cummings
abarrycummings@gmail.com

U – News

(for Student Members)

Submissions Due Feb 11th for Student Paper Contest 2011

Schedule for the 2011 Student Paper Contest are as follows, with Submissions due by Friday, February 11th, and the Oral Presentations scheduled for Saturday, February 26th.

See <http://ewh.ieee.org/r6/phoenix/StudentPaper.htm> for details.

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.

Nick Leonardi
480-720-1435 Cell
nleonardi@ieee.org
Student Activities Chair

Student Branches

ASU Main, Engineering
Chair: Saurabh Naik,
480-252-0504, svnaik@asu.edu
Advisor: Cihan Tepedelenlioglu,
480-965-6623, cihan@asu.edu

ASU Main, Computer Society
Chair: TBD
Advisor: Guoliang Xue
480-965-6218, xue@asu.edu

ASU Polytechnic
Chair: TBD
Advisor: TBD

DeVry, Phoenix
Chair: TBD
Advisor: Diane Smith
dsmith2@devry.edu

DeVry, Computer Society
Chair: TBD
Advisor: Diane Smith
dsmith2@devry.edu

NAU, Engineering
Chair: TBD
Advisor: Niranjana Venkatraman
v.niranjana@ieee.org

Embry-Riddle, Prescott
Chair: Tim Lemm
timothy.lemm@erau.edu
Advisor: John E. Post
posti@erau.edu

U – Newsbytes

- ASU Polytechnic is currently seeking Advisor for the Student Branch. Please email Nick (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, Nick Leonardi at nleonardi@ieee.org.
- View pictures from the MicroMouse contest at the Southwest Area Spring 2010 meeting at <http://picasaweb.google.com/ieeegoldphx/2010IEEESpringMeeting> (photography by David Huerta, GOLD Affinity Group Chair)



Phoenix Chapter of IEEE Signal Processing Society and Communications Society



Thanks to the attendees who made the January technical meetings successful.

Please contact David Frakes (dfrakes@asu.edu) to volunteer or propose a speaker for upcoming meetings.



INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

COMPONENTS, PACKAGING AND
MANUFACTURING TECHNOLOGY SOCIETY
ECTC Electronic Components & RF Program Committee
CPMT RF & Wireless Technical Committee



61st ECTC May 31 – June 3, 2011
Walt Disney World Swan & Dolphin Resort
Lake Buena Vista, Florida USA

The ECTC Electronic Components & RF Program Committee and the CPMT RF & Wireless Technical Committee encourage you to submit an abstract to ECTC 2011 in the areas of passive components & networks, RF & Microwave components & modules, and subsystems. ECTC is the premier Electronic Components and Packaging conference held annually and attended by about 1000 delegates with equal participation from companies and academia. As in the past, Electronic Components, RF & Microwave, and MEMS related papers are solicited for focus sessions during this prestigious conference.

RF, Microwave, Terahertz Components & Modules

Integrated antennas, filters, baluns, tunable devices & switches; high power & high efficiency RF/Microwave power amplifiers – design, technology & high frequency characterization; module integration in semiconductor, organic, & glass substrates – System in Package, System on Chip, Package on Package, & 3D integration; shielding, isolation, nanoscale structures for enhancing performance

RFID

Design & development of miniature interconnects for HF, UHF & WiFi RFIDs; assembly & matching with antennas & passives; universal RFID modules; RFID enabled wireless sensor nodes; power scavengers & nanomaterials for autonomous RFID's; flexible/conformal materials & printing technologies; reliability & environmental issues; metal-mounted RFID assembly & integration; multiband RFID's; integration of RFID's & batteries; RFID reader packaging; "rugged" RFID packages for space & extreme environments

RF MEMS & Sensors

RFID, RF MEMS, MEMS, MEMS packaging; MEMS/NEMS-enabled sensors, nanotechnology-based sensors, MEMS-based power scavenging; low-cost "Smart House" & "Smart Skin" sensor integration & packaging

Medical Devices for Monitoring, Imaging, WPAN/WBAN & Biomedical Applications

Design, materials, processing, manufacture, modeling & characterization; UWB & THz imaging & monitoring devices; technology for integrated wireless implantable/wearable electronics, including energy harvesting, ultra-low power electronics & batteries; 3D packages for ultra-miniaturization; biocompatibility, BioMEMS & microfluidic packaging

Flexible & Printed Electronics

Printing electronics technologies up to mmW frequencies; 3D printed RF electronics modules; low cost substrates; flexible RF modules, interconnects & adhesives; integration with wearable/implantable wireless personal networks, smart fabrics; inkjet- & gravure-printed RF components; environmentally-friendly RF substrates, antennas & passives

Discrete and Embedded Electronic Components, Materials, Processing, Reliability, & Manufacturing

Design, materials, processes, & reliability considerations for discrete passive components: resistors, capacitors, inductors, & passive networks, including through silicon vias (TSV), wafer level RDL, nano materials & processes

SUBMISSIONS:

Please submit abstracts using the ECTC web site: www.ectc.net by October 15, 2010. Abstracts must comply with the guidelines outlined at the website. To have your paper considered for inclusion in the "Electronic Components & RF" focused sessions

YOU MUST SELECT

"Electronic Components & RF" committee as your PRIMARY subcommittee preference when you submit your abstract at the ECTC web site. Again, to have your paper considered, please do the following:

STEP #1: Submit abstract through the ECTC web site (www.ectc.net) and select **"Electronic Components & RF" as PRIMARY subcommittee preference**

STEP #2: Email abstract copy and author's email & contact information to:
Craig Gaw at c.a.gaw@ieee.org & Rockwell Hsu at r.hsu@wilinx.com



2011 IEEE PES Power Systems Conference & Exhibition



<http://www.psceexpo.com/>

IEEE Power & Energy Society
PSCE
2011 Power Systems Conference & Exposition
 March 20 - 23, 2011 • Phoenix, Arizona, U.S.A.
 IEEE
 IEEE PES
 Power & Energy Society*

Host Utility Companies:

- Home
- Call for Papers
- Local Organizing Committee
- Technical Program
- Accommodation & Venue
- Registration
- Paper Submission
- Exhibition
- Support Opportunities
- Technical Tours
- Social Tours
- Tutorials
- Plain Talk Course
- Mailing List
- Previous Conferences

Latest News

- The [Program Schedule](#) is now available.
- [Click here](#) to book your room at the Wyndham for the PSCE group rate of \$189!
- [Online Registration](#) is now open.
- The call for papers and paper submission are now closed.

Welcome

Building on the success of past editions, the 2011 IEEE PES Power Systems Conference & Exhibition (PSCE) is a major power systems event that will provide an exceptional venue for discussing issues and developments as well as for highlighting key vendors with products and services essential to the multifaceted field of electrical power systems.

PSCE will bring together an international group of practicing power systems engineers, operators, planners, policy makers, economists, academics, and others with interest in the profession.

The conference will begin with a timely and valuable plenary session and will also include tutorials on the most up-to-date topics on power systems. Paper-, panel- and poster-sessions and paper forums will be scheduled along with featured Super Sessions on the theme of: **The Next Generation Grid – Putting It All Together**

- Smart sensors, communication and control in energy systems
- Smart grid for distributed energy resources
- Cyber and physical security systems of the smart grid
- Advanced computational methods for power system planning, operation, and control
- Emerging software needs for the restructured grid
- System-wide events and analysis methods
- Intelligent monitoring and outage management
- Integrating wind and solar energy into the grid
- Substation and distribution automation
- Internet tools for better understanding of power systems
- Dynamic performance and control of power systems
- Market interactions during system-wide events
- Asset management
- Flexible AC transmission systems
- and much more

<http://www.psceexpo.com/>



IEEE PES February 2011 Luncheon Meeting



Date: Thursday February 17, 2011

Time: 11:30 am - 11:45 noon: Registration
11:45 noon: Lunch
12:15 pm: Program

Location: Radisson Hotel Phoenix Airport North ([map](#))
427 North 44th Street
Phoenix AZ

Speakers: Meliha B. Selak, P. Eng

Topic: Power System Protection Schemes in Modern Power Systems
with Distributed Generation

Cost: \$5.00 (No cost if you are a college student)

Reservations: Contact Nancy or Stacy at (480) 991-9191
Ext 10 or Ext 16 or submit your name [here](#).
Reservations deadline is Noon on Monday, January 17, 2011.

If you have already registered for this luncheon but need to cancel, click [here](#).

Abstracts of the case studies:

This presentation introduces an overview of the power system modeling and simulations focusing on the transient studies and steady-state simulations. The transmission line data calculation will be presented. How simulation results can affect the power system protection schemes will be illustrated on the most recent installation of the 30 MVA distributed generation connected to the Power system. Stability and transient studies results indicated that some conditions can not be acceptable from system operation point of view and therefore, some remedial measures had to be taken. For instance, communication assisted power system protective scheme has been required on the transmission lines that were typically protected with communication independent scheme. This would provide faster clearing time for the faults on the line to avoid system instability in the system. Also, the studies have shown that there would be transient and temporary O/V when only small unit is in-service when there is a single line to ground fault (SLG) on the line. Such an overvoltage would be imposed on some distribution customers and would significantly exceed power quality guidelines. To maintain the power quality of the system, the line was required to remain connected to the system on SLG fault condition until generation is disconnected.

Biography:

Meliha B. Selak is a Specialist Engineer in Electrical Power Systems with BC Hydro. She has an Electrical Engineering degree from the University of Sarajevo and has over 30 years of experience in various aspects of power systems engineering including utility protection, research & development, project management and consulting on international projects. Prior to joining BC Hydro in 2000, she worked as a research engineer in the Power System Group at the University of British Columbia on Real-Time Power System Simulator in connection with EMTP. Her technical activities include power system protection and control applications, power system analysis, evaluations and interconnection studies for the various plants connecting to the power system, as well as development of the protection guidelines.

She is a registered professional engineer in the Province of British Columbia and she is a senior member of IEEE. Meliha is a member of the IEEE Power & Energy Society (PES) Governing Board and she is currently serving as the Vice President for Chapters. Also, she is a corresponding member of the IEEE Power System Relay Committee (PSRC). She has written numerous technical reports and papers on the power system subjects and she is also a paper reviewer. Meliha is a distinguished lecturer of IEEE PES.

1. Electrical Shock and/or Severe Burns due to contact with a 13.8 kV Distribution Conductor - This case study involved two workers, who were washing windows and were using a 40 foot aluminum ladder, in its extended position. After washing a set of windows, the workers started moving the ladder, while it was in its extended position. They lost control of the ladder and as the ladder fell, it landed on a primary distribution conductor. Due to the relatively high fault current, the two workers were very severely burnt. The plaintiffs' alleged that if the aluminum ladder had insulating links, it would have prevented the accident. This case study was also included in Chapter 2, "Overview of Electronic Systems Reliability" by Martin P.L., Medora N. K., and published in the Electronic Failure Analysis Handbook ©1999 McGraw Hill Book Company.

2. 75 MVA Power Transformer (with LTC) Failure - A power transformer with a Load Tap Changer (LTC) that varied the voltage on the low-voltage side from 38 kV to 15 kV was used to supply power to an electric arc furnace. The transformer was rated at 40/53.3/66.67/74.7 MVA, 138 kV Δ /38-15 kV Y, three-phase, 60 Hz. Downstream of this LTC transformer was a furnace transformer which stepped the voltage down from 34 kV to 600 V and was connected to the arc furnace leads. There was an explosion and the transformer failed violently.

3. Power Harmonic Problems at a Plastics Extrusion Plant - A plastics extrusion plant operated a 250-hp thyristor dc adjustable speed drive from a 300-kVA, 13.8 kV to 480 V utility service transformer on two miles of 13.8 kV line. The operation was marginal. Tripping of the drive occurred on under voltage dips. To raise the power factor and reduce the voltage drop, the plant personnel installed 300 kvar of capacitors on the 480-V system. The installation was made without a power-harmonic study. The result was frequent tripping of the drives and noisy operation.



Life Member Affinity Group

2011 February Technical Meeting

Topic: To be announced

When: Monday, February 14, 2011, 11:00am – 1:00pm

Where: SRP's **PERA Club** Bighorn Room,
1 East Continental Drive, Tempe, AZ
West of 68th St., ½ mile south of McDowell Road

Click this map link to SRP PERA Club:

<http://insidesrp/pera/facilities/PERAstreetmap.pdf>

RSVP: Please respond to Program Chair, Ronald Sprague by email:
rlsprague@q.com

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.

An IEEE member automatically becomes an IEEE "Life Member" status when at least 65 years of age and the sum of your current age and years of membership is 100. For more details use the link

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.

Technical meeting topics and suggested speakers are encouraged. Contact any Officer.

Future Technical Meetings:

- Monday, February 14, 2011 SRP PERA CLUB
- Tuesday, May 10, 2011 SRP PERA CLUB
- Tuesday, October 11, 2011 SRP PERA CLUB
- Tuesday, December 6, 2011 SRP PERA CLUB

Officers: The results of the annual election of officers, held December 7, 2010 meeting, resulted in the following.

Chair	A. Barry Cummings	Barry.Cummings@srpnet.com
Vice Chair	Michel Ebertin	Michel@ebertin.net
Secretary	Tom Lundquist	Tom-LCS@COX.NET
Treasurer	Leslie Daviet II	lesdaviatii@cs.com
Program Chair	Ronald L. Sprague, P.E.	rlsprague@q.com
Past Chair	C Bruce Johnson	cbj@johnsonscientificgroup.com

**February Meeting
Announcement for the
Phoenix Chapter of the IEEE
EMC Society**



Date: Tuesday, February 15th, 2011
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: 5:30PM Social, 6PM Dinner (order off the menu),
7PM Meeting in Embassy Suites Junior Ballroom (upstairs)

Title: Rod Antenna Grounding Issues for MIL-STD-461E and 461F

Speaker: Keith Peavler, Chief Engineer EMC for Honeywell Aerospace

Abstract: There have been various papers written on theoretical predictions of the active rod antenna in configurations conforming to MIL-STD-461E and 461F, specifically to the counterpoise grounding. Recently while developing and qualifying a product for a military helicopter, the RE102 limits were exceeded within the 20-30 MHz region. Further investigation ensued including the collection of empirical data for both MIL-STD-461E and 461F rod antenna configurations, while being referenced to a calibrated biconical antenna. This presentation discusses the empirical findings of the two rod antenna configurations thus growing the body of information related to the MIL-STD-461E to 461F migration of antenna grounding.

Biography: Keith's past roles include EMC engineering and leadership positions within various design and test organizations. Before joining Honeywell in 2004, Keith worked in the EMC field with the Boeing Company on systems for the 747, 767, and 777 aircraft models. After which, he moved from aerospace to the telecommunications industry with AT&T Wireless leading the EMC Design and Test organization while serving on the ANSI C63 standards committee. Currently, he's responsible for EMC design consultation, along with standards, technologies, strategies, and roadmaps for Honeywell Aerospace products across the Electronics Center of Excellence. He serves on the RTCA committee and has a bachelor's degree in electrical engineering and is Six Sigma Green Belt certified.

Reservations: To help us get an accurate headcount, please send an email to Harry Gaul (mailto:harry.gaul@ieee.org). 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 Components, Packaging
and Manufacturing Technology Society**

Phoenix Chapter

Wednesday, February 16th, 2011 at 6 PM

On-Chip Inductor Incorporating Magnetic Materials

Dr. Hongbin Yu

**Assistant Professor, School of Electrical, Computer and Energy Engineering
Arizona State University
Tempe, Arizona 85287**

ABSTRACT:

Continued scaling of electronic device and systems and the increasing demand of circuit functionality require continued scaling of passive components, such as inductors, which typically occupy large area compared to other circuit components. Incorporating magnetic material with on-chip inductor is one of the most researched approaches to increase inductance, quality factor, and silicon chip-area efficiency. These efforts will produce inductors with much higher area efficiency and quality, enabling applications in radio frequency (RF) and analog/mixed signal (AMS) circuit design, such as power amplifier, distributed wireless circuits, low noise amplifiers, high-speed signaling and clocking, which will benefit ultimately the efficient integration for System-on-Chip (SoC) applications. In this presentation, recent efforts on incorporating magnetic materials into on-chip inductor will be reviewed, with particular emphasis on the use of materials such as permalloy (NiFe) and Co-Zr-Ta (CZT). Factors that could affect inductor performance including eddy current loss and ferromagnetic resonance of the magnetic materials will be discussed.

BIOGRAPHY:

Prof. Hongbin Yu received his PhD in physics in 2001 from the University of Texas at Austin, and his BS and MS in physics from Peking University, P. R. China, and conducted his post-doctoral research at California Institute of Technology and University of California at Los Angeles between 2003 and 2005, before joining Arizona State University faculty in 2005. In addition to the research on the scaling of on-chip inductors, his research interests are also on the advanced nano electronic device fabrication and characterization, flexible electronics and optoelectronics based on high quality electronics materials and directed self-assembling of nanostructures for device applications.

Date: Wednesday, February 16th, 2011

Location: Group Conference Room, Freescale Semiconductor, Inc., 2100 E. Elliot Rd. Tempe, AZ. Enter the facility through the Main (South) lobby in building 94, by the flag poles; you will be escorted to the meeting venue.

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.

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

Vivek Gupta (480) 413-5849 Surinder Tuli (480) 554-8275 Samir Pandey (480) 552-7502
Vasu Atluri (480) 227-8411 Linda Chow (480) 552-3431 Karla Reyes (480) 554-1045

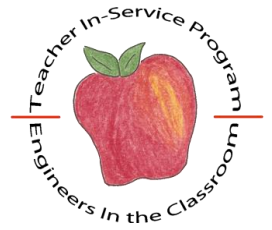


TISP/EIC Report

1 February 2011

Mike Poggie

John F. Purchase



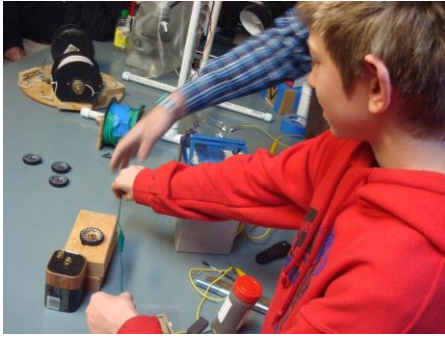
School Support Plan For 2010 / 2011 School Year:

- In the current support plan for the 2010 / 2011 school year we now have:
 - 9 schools / 44 classes in 2010, September 1 – December 31
 - 11 schools / 69 classes in 2011, January 1 – May 31
 - A total of 2562 students
 - This student count excludes Kid Zone where we only loan the capital equipment
- We are basically fielding a team of 4 – 5 members to a school each and every week until the end of May
- We are already receiving bookings for the next 2011 / 2012 school year
 - October is already fully booked

We Offer Six Ready-To-Run Lesson Plans:

- "Sail Away" – Archimedes Principle, Newton's Laws
- "Working With Watermills" – Mechanical Advantage, Simple Machines
- "All About Electric Motors" – Magnetism, Electromagnetism, Electric Motors
- "Here Comes The Sun" – Electric Circuits, Sources & Loads In Series & Parallel, Solar Cells
- "Rockets!" – Newton's Laws
- "Popsicle Bridges" – Structures In Compression And Tension
- Three of them were new this year:
 - All About Electric Motors
 - This was actually a rework of an existing lesson plan from the beginning of EIC
 - Rockets!
 - Popsicle Bridges

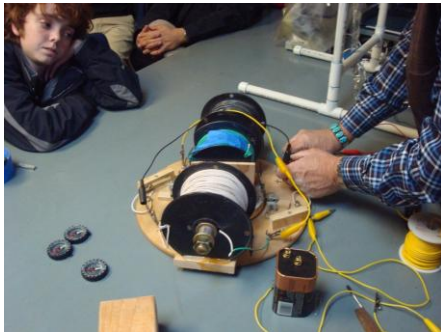
TEACHING ELECTROMAGNETIC THEORY & PRACTICE



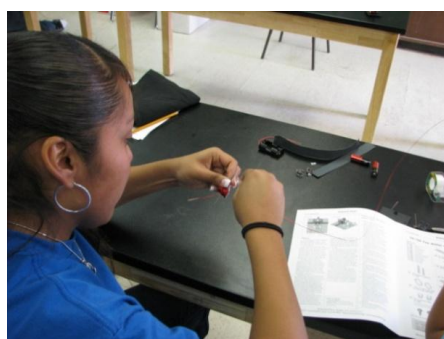
DEMONSTRATING ELECTROMAGNETICS



DEMONSTRATING ELECTROMAGNETICS



WINDING THE KIT MOTOR ARMATURE



2/1/2011

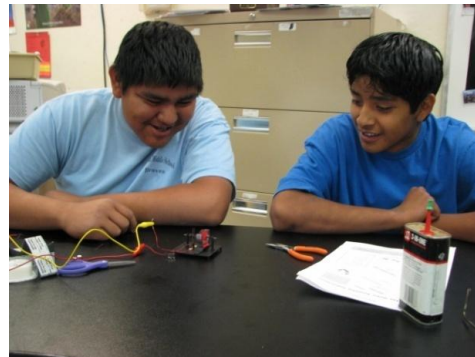
IEEE TISP/EIC

4

WORKING OUT WHAT TO DO



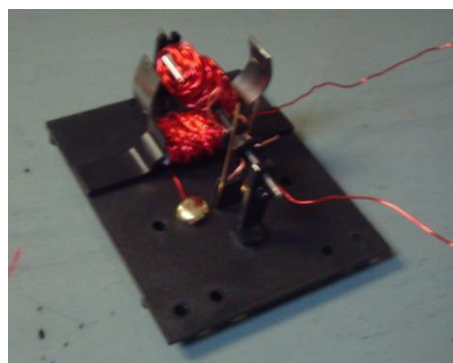
SUCCESS!



THE ENGINEERS HELP OUT



STUDENT'S KIT MOTOR AS BUILT



2/1/2011

IEEE TISP/EIC

5

TEACHING ROCKET THEORY



DEMO OF CP / CG OFFSET FOR FLIGHT STABILITY



TEACHING THE SIMULATOR OPERATION



THE SCIENCE TEACHER HELPS WITH THE SIMULATOR



2/1/2011

IEEE TISP/EIC

6

BUILDING



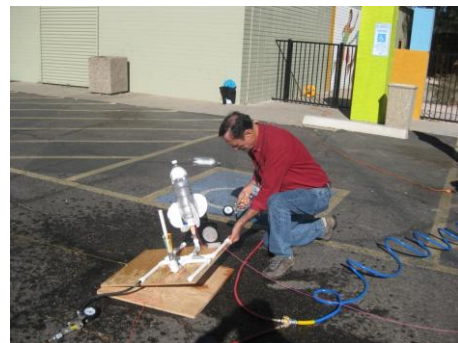
BUILDING



A COMPLETED ROCKET!



LAUNCH!



2/1/2011

IEEE TISP/EIC

7

We Did A "Classic TISP" In January:

- The Principal of Rover Elementary in Tempe is converting his school to an Arts And Science Academy
- Consequence of pressure from parents unhappy with NCLB
- Started in 2009 and completes in 2011
- Is getting some support from a professor at ASU School of Engineering
- He asked Phoenix TISP to conduct a "classic TISP" session to train 14 of his grade 2 thru' 5 teachers in how to teach STEM
- TISP session was scheduled for Friday, January 7th and Saturday, January 8th
- Led by Mike Poggie with support from
 - John Purchase
 - Dave Leeper
 - Tom Innes
- Lecture followed by two hands-on lesson plans from TryEngineering
 - All About Electric Motors
 - Popsicle Bridges
- After the session the principal, Mark Martinez, told us it had been exactly what he wanted
- The teachers also all expressed their appreciation and enjoyment of the session
- Our equipment and material costs are being covered by IEEE National Office

MIKE P LECTURES ON IEEE & TISP



DAVE L LECTURES AND JOHN P DEMO'S MAGNETISM



JOHN F LECTURES ON TEACHING GRADES 2 – 5



JOHN F LAUNCHES AN AIR ROCKET

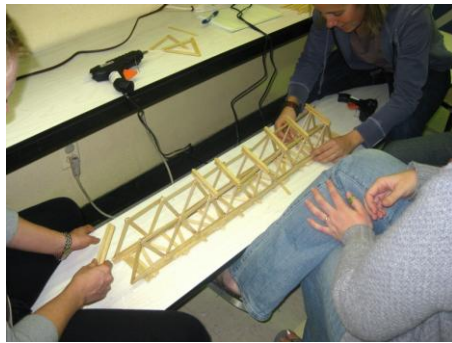


2/1/2011

IEEE TISP/EIC

10

BUILDING TRUSSES



BUILDING A TRUSS STRUCTURE



COMPLETE WITH SPARKLES!



AND IT CARRIES 50 LBS!



2/1/2011

IEEE TISP/EIC

11

A FINISHED TRUSS BRIDGE, BUT.....OOPS!



A MASSIVE TRUSS THAT CARRIED 75 LBS WITH HARDLY ANY SAG!



2/1/2011

IEEE TISP/EIC

12



IEEE-USA Government Fellowships:

Linking Science, Technology & Engineering Professionals with Government

(<http://ieeusa.org/policy/govfel/default.asp>)

Each year, IEEE-USA sponsors three government fellowships for qualified IEEE members. The fellows - chosen by the IEEE-USA Government Fellows Committee and confirmed by the Board - spend a year in Washington serving as advisers to the U.S. Congress and to key U.S. Department of State decision-makers. Known as either a Congressional Fellowship or an Engineering & Diplomacy Fellowship, this program links science, technology and engineering professionals with government, and provides a mechanism for IEEE's U.S. members to learn firsthand about the public policy process while imparting their knowledge and experience to policymakers.

2012 Application materials are now available online. **The deadline is March 18, 2011**

Application Kit for 2012 Congressional Fellowship

http://ieeusa.org/policy/govfel/documents/cfappkit12_000.doc

Application Kit for 2012 Engineering & Diplomacy (State Department) Fellowship

http://ieeusa.org/policy/govfel/documents/Stateappkit12_000.doc



Women In Engineering Affinity Group (WIE)

The IEEE Phoenix Section supports establishing a local **Women in Engineering (WIE) Affinity Group**. Before moving forward with the process, we would like to ascertain the level of interest in the area of the Phoenix Section. If you see value in having this group and if you would be interested in participating in local WIE Affinity Group activities, please contact Shamala Chickamenahalli (shamala@ieee.org), Lesley Polka (lesley.a.polka@intel.com) and Diane Watkins (diane.watkins@srpnet.com) by February 28, 2011. Please indicate if you would be willing to serve on the organizing committee and which roles would be of interest to you (e.g., Chair, Vice Chair, Treasurer/Secretary, Publicity/Web).

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 their website:

http://www.ieee.org/membership_services/membership/women/women_about.html

Looking forward to hearing from you,
Shamala, Lesley and Diane



Phoenix Chapter of the IEEE Computer Society

February, 2011

News

- Chapter officers met in January to discuss plans for our meetings in 2011. We have elected to move to a bi-monthly schedule for this year. Our chapter meetings will be held on the first Wednesday of the odd numbered months. For the month of March we will have our annual spring chapter picnic rather than an evening meeting. The next evening meeting will be on May 4th at DeVry.

Future Events

- February 2, 2011 – NO MEETING
- March 27, 2011 – Chapter picnic, Wilkin Ramada, McCormick-Stillman Railroad Park, Scottsdale; details forthcoming, picnic will begin at 3:00 pm.
- May 4, 2011 – Chapter meeting, DeVry University; speaker: TBD

Meetings start at 6:00 pm with networking and light refreshments in the courtyard followed by the presentation at 7:00 pm. DeVry University is located at 2149 W Dunlap Avenue, Phoenix.

Visit the CS Chapter website for the latest information: <http://ewh.ieee.org/r6/phoenix/compsociety/>

If you would like to suggest a topic and/or speaker for any of our 2011 meetings, please contact one of the chapter officers:

Jerry Crow (jerry.crow@computer.org)
Brad Morantz (bradscientist@ieee.org)
Audrey Skidmore (askidmore@computer.org)
Diane Smith (diane@web-oasis.com)



WAVES AND DEVICES

PHOENIX CHAPTER

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

2011 Calendar



<u>Date</u>	<u>Time</u>	<u>Location</u>	<u>Topic / Title / Status</u>	<u>Speaker</u>	<u>Affiliation</u>
Postponed until further notice		Agilent, Chandler	Radio Communications Systems on Next Generation Manned Space Vehicle	Mr. William Boger	General Dynamics
17-Jan	5:00 PM	Freescale	1) Electromagnetic Band Gap (EBG) Structures in Antenna Engineering: From Fundamentals to Recent Advances 2) Green" RFID and Wireless Sensor Nodes: The Final Step to Bridge Cognitive Intelligence, Nanotechnology and RF?	1) Dr. Yahya Rahmat-Samii 2) Dr. Manos Tentzeris	1) UCLA 2) Georgia Tech
18-Feb	4:00 PM	ASU GWC487	Miniaturized Directional Microphones and Microspeakers for Hearing Aids Applications	Dr. Junseok Chae	ASU
28-Feb	1:00 PM	ASU GWC487	Joint Meeting With SSCS: Technology Challenges of Integrated Voltage Regulators for Future Microprocessors and SOC's	Dr. Shamala A. Chickamenahall	Intel
24-Mar	5:30 PM	ASU GWC487	Semiconductor Device Characterization and Failure Analysis	Dr. Dieter Schroder	ASU

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
WAVES AND DEVICES - Phoenix Chapter

Meeting Free & Open to Non-IEEE Members

4:00PM, Friday, Feb 18, 2011

**Arizona State University
Goldwater Center, GWC487
650 E. Tyler Mall, Tempe, AZ**



Miniaturized Directional Microphones and Microspeakers for Hearing Aids Applications

Dr. Junseok Chae of Arizona State University

Abstract

MEMS (Micro-Electro-Mechanical-Systems) are attractive for small size, low power, light weight, and potentially low cost. Many MEMS devices have been successfully commercialized such as inkjet printer heads, acceleration sensors, pressure sensors, gyroscopes, and digital mirrors. In this talk, I present MEMS-based directional microphones and microspeakers for hearing aids applications. ~ 10% of population in US are having hearing difficulty/impair. Statistically ~ 30% or more of age of 60 or older and ~ 2% of age of 18 or younger are having hearing difficulty/impair. Despite of such large population not many young patients currently use hearing aids, partially because of social stigma. This project is to aim to develop miniaturized hearing aids components (microphones and microspeakers) to explore possibility of directional and low power hearing aids.

Biography:

Junseok Chae received the B.S. degree in metallurgical engineering from the Korea University, Seoul, Korea, in 1998, and the M.S. and Ph.D. degrees in EECS (Electrical Engineering and Computer Science) from the University of Michigan, Ann Arbor, in 2000 and 2003, respectively. After a couple of years of being research fellow at Michigan, he joined Arizona State University as an assistant professor in electrical engineering in 2005 and now he is an associate professor. His research areas of interest are MEMS for biomedical applications. He received the 1st place prize and the best paper award in DAC (Design Automation Conference) student design contest in 2001. He has published over 80 journal and conference articles, one book, two book chapters, and holds two US patents. He received NSF CAREER award on MEMS protein sensor array.

Date: **Friday, Feb 18, 2011**

Time: **4:00 PM Presentation**

Location: Goldwater Center, GWC487, Arizona State University, **650 E. Tyler Mall, Tempe, AZ**

For more information, contact:

Steve Rockwell (WAD Chapter Chair)

(480) 241-9891

steve.rockwell@ieee.org

Haolu Xie (Chapter Publicity)

(480) 413-5644

haolu.xie@ieee.org

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



INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS
WAVES AND DEVICES - Phoenix Chapter

Meeting Free & Open to Non-IEEE Members

4:00PM, Friday, March 24, 2011

Arizona State University
Goldwater Center, GWC487
650 E. Tyler Mall, Tempe, AZ



Failure Analysis of Semiconductor Devices

Dr. Dieter Schroder of Arizona State University

Abstract:

The first task during failure analysis is failure site location. This becomes progressively more difficult as the feature size of today's devices continue to shrink, the device structure becomes more complex, consisting of many metal layers, flip-chip bonding, etc., pushing many existing characterization tools to the limits. Techniques to be discussed include IDDQ testing, laser stimulated defect localization methods, emission microscopy, microprobing, voltage contrast, optical beam induced resistance change, and picosecond imaging circuit analysis. Well-established techniques like mechanical probing have taken on a second life as scanning probes with submicron mechanical resolution have been developed. Transmission electron microscopy is continuing to improve with sub-Angstrom resolution, allowing imaging of individual atoms. I will give relevant examples of these various techniques.

Biography:

Dieter K. Schroder has worked with semiconductor material and device electrical characterization for the last 40 years. He received his education at McGill University and at the University of Illinois. He joined the Westinghouse Research Labs. in 1968 where he was engaged in research on various aspects of semiconductor devices, including MOS devices, imaging arrays, power devices, and magnetostatic waves. In 1981 he joined Arizona State University, where his current interests are semiconductor devices, defects in semiconductors, semiconductor material and device characterization, low power electronics, photovoltaics and device modeling. He has written two books Advanced MOS Devices and Semiconductor Material and Device Characterization, edited 11 books, has written over 180 papers and 10 book chapters, holds 5 patents, supervised 105 graduate students. He has received several teaching awards, has taught many short courses in the area of Semiconductor Characterization and is an IEEE Life Fellow.

Date: **Thursday, March 24, 2011**

Time: **5:30 PM Presentations**
Pizza will be served following the Seminar

Location: Goldwater Center, GWC487, Arizona State University, [650 E. Tyler Mall, Tempe, AZ](#)

For more information, contact:

Steve Rockwell (WAD Chapter Chair)	(480) 241-9891	steve.rockwell@ieee.org
Haolu Xie (Chapter Publicity)	(480) 413-5644	haolu.xie@ieee.org

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



INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS



Solid State Circuits Society & Waves and Devices Society Phoenix Chapter

Meeting Free & Open to Non-IEEE Members
1:00pm to 2:00pm, Monday, February 28th, 2011
Arizona State University - GWC 487 (map)

Technology Challenges of Integrated Voltage Regulators for Future Microprocessors and SOC's

Dr. Shamala A. Chickamenahalli. (shamala.chickamenahalli@intel.com) **Intel Corporation**

Abstract:

The demands on miniaturization in power electronic products in all areas of applications and in all power ranges are pushing power delivery technologies to be better than ever. The ingredient technologies are compelled to demonstrate these enhancements in terms of power efficiency, response speed, real estate and cost simultaneously. While multiple features such as CPU cores, graphics, memory, etc are integrated in a single piece of Silicon, powering these multiple features effectively is as important as managing this power in order to achieve savings in power and cost. Power designers are challenged to address scalability and optimization of each power rail with overall application architecture in mind, rather than fitting an existing power delivery solution to the application. Added to this is the escalating demands on the package and associated interconnect technologies to be low in loss, compact in size and higher in density. Traditional high voltage, low frequency voltage regulator philosophies do not fit the need and require vast transformations in overall design to be suitable in integrated environments. In addition, their control methods, device technologies, and passives technologies need exorbitant strides in maturity to exhibit truly integrated voltage regulator functionality. Mixed signal or heterogeneous integration of technologies is called for so that there is a venue for integration. This presentation will reiterate some of these needs and provides a call for action in the critical areas where the corresponding voltage regulator ingredient technology breakthroughs should be happening in the next few years.

SSCS-PHX Chapter Website: http://www.ieee.org/go/sscs_phx

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

Biography:

Shamala A. Chickamenahalli (S'93-M'95) received her B.E and M.Tech degrees in electrical engineering from Bangalore University and Indian Institute of Technology, Khargapur, India, in 1983 and 1986. She obtained her Ph.D. in electrical engineering from the University of Kentucky, USA, in May 1995. From 1986 to 88, she worked as a



senior engineer at Kirloskar Electric Co., India, and from 1988 to 90, as a Scientist at a defense research laboratory in India. She was an Assistant Professor from Aug 1994 to May 1999 at Wayne State University, Detroit, Michigan where she taught and carried out power electronics research based on DSP's for automotive applications. Currently she is a staff research engineer at Intel Corporation, Arizona, where she concentrates on voltage regulator technologies for current and future microprocessors. Her areas of research interests include modeling, analysis and simulation and strategic research on power converter topologies.



Become an IEEE Senior Member

If you have 10 years of experience in electrical engineering (including any time in graduate school) you may qualify for elevation to IEEE Senior Member!

Apply on-line at the following link:

http://www.ieee.org/membership_services/membership/senior/senior_application.html

Need help with reference letters or a nomination? Contact any Section officer (see page 1 for contact information).



IEEE Phoenix Section Volunteer Positions

The Section Executive Committee is currently looking for volunteers for the positions of Membership and Publicity Chairs! If interested please contact Section Chair Jim Hudson (jim.hudson@srpnet.com) for more information.



Upcoming IEEE Conferences in Phoenix

The ***IEEE Power & Energy Society*** will sponsor the conference entitled ***2011 Power Systems Conference & Exhibition (PSCE)***. This conference will be held in the Phoenix Convention Center in Phoenix, Arizona, USA, on March 20–23, 2011. For further information please click on the following link:

<http://www.psceexpo.com/>

The conference is currently being hosted by the following utilities: Arizona Public Service, Salt River Project, Tucson Electric Power (UniSource) UniSource Energy Services (Kingman), Page Electric Utility, Navopache Electric Cooperative, Trico Electric Cooperative, Southwest Transmission Cooperative and the City of Mesa.

The conference theme has been identified as: ***The Next Generation Grid... Putting it All Together***. It is expected that professionals from the worldwide power and energy industry will attend the event. Individuals who are practicing power systems engineers, operators, policy makers, economists, academics and others with interest in the advancing the state-of-the-art in power systems are encouraged to attend and register early to achieve the best conference registration fee and the most preferred rate for their hotel room reservation. The conference program spans four days and is combined with a three-

day exposition. The technical conference program will include technical poster sessions, focused technical panel sessions, instructional tutorial sessions, a special short course, a collegiate program and an exposition that features exhibitors who will showcase state-of-the-art software and hardware systems and consulting services for those attendees who are involved with power systems. Significant papers originating from all PES Technical Committees of the Power & Energy Society will be presented.

A comprehensive technical program is offered to attendees and will include the following subjects:

- Smart sensors, communication and control in power and energy systems
- Smart grid for distributed energy resources
- Cyber and physical security systems for the Smart Grid
- Advanced computational methods for power system planning, operation, and control
- Emerging software needs for the restructured grid
- System-wide events and analysis methods
- Intelligent monitoring and outage management
- Integrating wind and solar energy into the grid
- Substation and distribution automation
- Internet tools for better understanding of power systems
- Dynamic performance and control of power systems
- Market interactions during system-wide events
- Asset management
- Flexible AC transmission systems
- And more...

Tutorials

A complete program of tutorials is being offered and will feature the topics listed below.

Visit www.psceexpo.com/Tutorials.asp

Tutorial T1: FACTS Controllers and Their Modeling Techniques

Tutorial T2: Understanding of Electrical Concepts in Wind Turbines and Photovoltaic Arrays

Tutorial T3: Microgrids – Designing Their Role in Smart Grid

Tutorial T4: Smart Grid Cybersecurity – Protecting the Smart Grid

Tutorial T5: Fundamentals of Wind Energy

Tutorial T6: Emerging Smart Grid: Improved Distribution Management System
Incorporating Advanced Solutions

Plain Talk Courses Offered 3 Days

Plain Talk about the Electric Power Industry Courses are co-located with the PSCE. Registration to the Conference not required. **PES PLAIN TALK** courses for the power industry professional will help you to understand technical aspects of the electric power industry, even if you do not have an engineering background. Topics include:

Power System Basics—Understanding the Electric Utility Operation Inside and Out

Distribution System—Delivering Power to the Customer

Transmission System—The Interconnected Bulk Electric System



2011 IEEE Phoenix Section Calendar

The calendar is updated by the Vice Chair on a rolling basis.

- February 2011
 - Annual Banquet: February 12, 2011
 - A great banquet with over 200 in attendance – pictures to come soon!
 - Budget planning: Chapters and Affinity Groups
 - Deadline for submission of L-50 reports to receive the 10% bonus: February 18, 2011
 - Student Paper Contest
 - Papers due on a Friday in mid-February: February 12, 2011 Oral presentations on a Saturday two weeks later: February 27, 2011
- March 2011
 - Finalize Student Branch officers for new academic year
 - Deadline to receive completed L-50 report and rebate: March 31, 2011
 - Budget planning: Student-Industry Mixer
 - Region 6 meeting: March 18-19, 2011 in Phoenix
- April 2011
 - Student-Industry Mixer
 - MicroMouse registrations due to Southwest Area: TBD
 - Student papers due to Southwest Area: TBD
 - Southwest Area Spring meeting incl. Student Paper and MicroMouse contests: TBD
 - Nominating Committee formed for election of next year's Section officers
 - At least three members that are not Section officers (Chapter officers okay)
- May 2011
 - Student Branch reports to IEEE HQ and Student Activities Chair due: May 1, 2011
 - Call for Nominations issued by Nominating Committee
- June 2011
 - Review meeting schedules of Chapters
 - Nominations received by Nominating Committee
- July–August 2011
 - Summer break
- IEEE Congress August 19 -22, San Francisco

- September 2011
 - Student Branches send annual plan of activities to IEEE
 - Annual Banquet: Determine date, confirm hotel, speaker
 - Announcement of Student Paper Contest
 - Announcement of Student Scholarships
 - Call for nominations for awards
 - Categories: Young Engineer/GOLD, Engineer, Company, Educator
 - October 2011
 - Announcement of Student Paper Contest
 - Announcement of Student Scholarships
 - Call for nominations for awards: see September
 - Southwest Area Fall meeting: TBD
 - November 2011
 - Election of new officers
 - 2011 budget proposal
 - Start ad for Student Paper Contest and Scholarships
 - For dates see under February
 - Student Industry Mixer: TBD
 - December 2011
 - Report of Section activities for 2011
 - Appoint chairs of Section committees
 - Student Scholarship applications due: TBD
 - Annual Banquet: Finalize speaker
 - Annual Banquet: E-mail program
-



Phoenix Section Executive Committee Meeting

Venue: Phoenix Airport Hilton 2435 S 47th St, Phoenix, AZ, 85034 ([map](#))
Tel.: 480-804-6017

More Info: Meetings are held on the first Tuesday of the month, 6–8 PM.
- Except for July & August

All interested IEEE members are welcome to attend.

Contact: Jim Hudson, Phoenix Section Chair
jim.hudson@srpnet.com

IEEE Phoenix - Calendar of Events

You may access the IEEE Phoenix Section Calendar of Events at:

<http://ewh.ieee.org/r6/phoenix/Calendar.htm>

For inputs and updates to the Calendar, please contact the IEEE Phoenix Section Treasurer, Russ Kinner at 602-997-2353 or e-mail: r.kinner@ieee.org

Phoenix Section LinkedIn Group

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