The Valley Megaphone

Newsletter of the
Institute of Electrical and Electronics Engineers, Inc.
Phoenix Section
April 2006, Volume XX, Number 4

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This Issue of The Valley Megaphone Features:

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Contents:

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

Please send announcements for Valley Megaphone to Eric Palmer: ecpalmer@ieee.org.

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The Valley Megaphone is the newsletter of the Phoenix Section of the Institute of Electrical and Electronics Engineers. It is published monthly and 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

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Advisor: Chuck Cone
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IEEE Solid State Circuits Society Phoenix Chapter is being formed:

Phoenix chapter of IEEE Solid State Circuits Society is being formed under the leadership of Prof. Bertan Bakkaloglu from Electrical Engineering Department of ASU and Dr. Xuezhen Wang from SiRF Technologies. Prof. Bahar Jalali Farahani will be the Secretary, Prof. Kevin Cao will be the Publicity Chair, and Prof. Youngjoong Joo will be the Treasurer. The founding chapter is eagerly working on finalizing the details of the committee formation and they are looking forward to bringing in several distinguished speakers to Phoenix and interact with local industry. Please contact Dr. Bakkaloglu for details:

Bertan Bakkaloglu
Email: bertan@asu.edu
Office : 480-727-0293

News from the Phoenix Chapter of the IEEE Education Society

By Martin Reisslein and Darryl Morrell

We formed the Phoenix chapter of the IEEE Education Society during 2005, obtaining the final approval for the chapter in December 2005. Generally, the Education Society is concerned with educational methods, instructional materials, teaching pedagogy, instructional technology, and professional development in the electrical and electronic engineering discipline. This range of interests is reflected the topics of the seminars at our technical meetings, which are for the spring 2006:

- February 1st, Dr. Chell Roberts: “Spinning out the Engineering Grey Matter: an Educational Cyclorama in a Parallel Universe”
- March 1st, Dr. Veronica Burrows: “Opportunities and Challenges for Engineering Education Research: From the National to the Local”
- March 28th, Senay Yasar: “A Joint Methodology: Using the Engineering Design Process to Determine Pedagogy”
- April 12th, Dr. Joseph Palais: “Electrical Engineering Online at ASU”

Our technical meetings are held on the Arizona State University Tempe Campus, Goldwater Center, Room 409 and open to the public.

IEEE Components, Packaging and Manufacturing Technology Society
Phoenix Chapter
Wednesday, April 19th, 2006 Tutorial Meeting

Thermal Design and Management in Electronics

Dr. Tom Lee, Manager, Freescale Semiconductor, Inc., Tempe, Arizona
Dr. Chia-Pin Chiu, Manager, Intel Corporation, Tempe, Arizona
Dr. Mali Mahalingam, Manager, Freescale Semiconductor, Inc., Tempe, Arizona
Dr. Ravi Prasher, Manager, Intel Corporation, Tempe, Arizona

Tutorial Scope

Thermal design and management challenges are common across a wide range of electronic products and applications. Road mapping by leading organizations (ITRS, SIA, and NEMI) identifies thermal management as one of the key challenges to overcome for the sustained growth in electronics. Higher density, performance, reliability and lower cost demand much from the thermal management professionals in creating solutions. The half-a-day tutorial taught by four professionals will address: Thermal Modeling and Characterization, Applications in the Computational and Wireless Communication Products, and Emerging Thermal Technologies. Non-experts and beginners in thermal discipline will be able to learn from the tutorial content. Professionals and subject experts can benefit from the teachers experiences and interactions with other participants.

Tutorial Agenda

12:00 – 1:00 PM	Registration
12:50 PM – 1:00 PM	Welcome Address by Dr. Daniel Lu and Dr. Mali Mahalingam
1:00 PM – 2:00 PM	Simulation and Characterization Methods in Electronics Thermal Design and Management *Dr. Tom Lee, Freescale Semiconductor, Inc.*
2:00 PM – 3:00 PM	Thermal Design and Management for High-Power Microprocessors *Dr. Chia-Pin Chiu, Intel Corp*oration
3:00 PM – 3:20 PM	Refreshment Break
3:20 PM – 4:20 PM	Thermal Design and Management for RFPAs in Wireless Applications *Dr. Mali Mahalingam, Freescale Semiconductor, Inc.*
4:20 PM – 5:20 PM	Micro/Nanotechnology in Electronics Thermal Management Applications *Dr. Ravi Prasher, Intel Corporation*
5:20 PM – 5:30 PM	Tutorial Wrap-Up

Tutorial Abstracts

Simulation and Characterization methods in Electronics Thermal Design and Management
Dr. Tom Lee, Freescale Semiconductor, Inc.

Thermal simulation and characterization are two essential tools to evaluate and optimize thermal performance of electronics packages. Thermal characterization usually can provide a direct and accurate way to measure device or package temperature; however, the efforts to prepare samples and the number of experimental matrix needed may be time consuming and sometimes costly. On the other hand, advancements in software and computing speed make modeling and simulation as effective methods in analyzing and predicting thermal performance. However, the uncertainty in our knowledge of material properties, model simplification and assumptions made in the modeling & simulation may limit the accuracy of results. Careful use of both characterization and simulation can make up for the deficiency in each and provide realistic and accurate results.

This presentation will first introduce some standard characterization methods and equipment to measure the temperature and the thermal resistance values of devices and packages. This includes infrared thermal imaging

technique and the electrical method for junction temperature measurement for all types of semiconductor devices. The second part will describe methodology, technique, and software tools for simulation and modeling. It will be followed by the applications of using simulation and characterization to analyze microelectronics thermal performance.

Thermal Design and Management for High-Power Microprocessors
Dr. Chia-Pin Chiu, Intel Corporation

Increasing microprocessor performance has historically been accompanied by increasing power and increasing on-chip power density both of which present a cooling challenge. In this session, the historical evolution of power is traced and the impact of power and power density on thermal solution designs is summarized. Industrial and academic researchers have correspondingly increased their focus on elucidating the problem and developing innovative solutions in devices, circuits, architectures, packaging and system level heat sinking. Examples of some of the current packaging and system thermal solutions are provided to illustrate the strategies used in their design. This is followed by a brief discussion of some of the future trends in demand and solution strategies that are being developed by academic and industrial researchers to meet these demands.

Thermal Design and Management for RFPAs in Wireless Applications
Dr. Mali Mahalingam, Freescale Semiconductor, Inc.

Wireless communication continues to be one of the key applications in the growth of the electronics industry. Similar to Processors being the key components enabling the growth in computing applications, Radio Frequency Power Amplifiers (RFPA) serve as the key components enabling the growth in wireless communication applications. RFPAs for both handheld and infrastructure equipment will be addressed. Focus will be on the high power RFPAs. Thermal performance, RF electrical performance, stringent reliability requirements and cost-effective solutions play vital roles in influencing the choice of structures, interconnects, materials, and assembly processes in creating solutions. RFPA semiconductor components for wireless infrastructure equipment dissipate large amounts of thermal energy, approximately 3 kW/cm^2 at die level, and known to be one of the highest among semiconductor devices. Thermal design and management at the component level are conduction dominated. This tutorial will address from the fundamental aspects of conduction to the state of the art in creating successful solutions. Future trends in RFPAs and the required thermal solutions will be briefly addressed.

Micro/Nanotechnology in Electronics Thermal Management Applications
Dr. Ravi Prasher, Intel Corporation

The research community is experiencing a revolution in microscale and nanoscale heat transfer, with a focus on developing fundamental experiments and theoretical techniques. More recently, these advancements have begun to influence the design of electronic systems. This tutorial will focus on the existing and future potential applications of microscale and nanoscale technologies on electronics thermal management. This course provides an overview of fundamental physics of heat transfer at micro and nanoscales, with a focus on those relevant for electronics cooling. These include thin film thermoelectrics, conduction physics in nano/micro engineered interface materials, and high-performance microchannel heat sinks.

Speaker Biographies

Dr. Tien-Yu (Tom) Lee is a Distinguished Member of Technical Staff at Freescale Semiconductor in Tempe, Arizona. Dr. Lee received his Ph.D. degree in Mechanical Engineering from the University of Minnesota, 1989. He joined Motorola's Semiconductor Products Sector in 1989 and has over 16 years of experience in developing and implementing leading edge thermal and mechanical solutions in design, simulation, and characterization of electronic packages from components to systems. Dr. Lee specializes in CFD thermal analysis and has developed various techniques on thermal management, such as high-speed infrared thermal imaging, single and two-phase liquid cooling, and established fully automatic data acquisition system. He is currently managing the RF Modeling and Characterization Group in Freescale to support product development for electronic packages in automotive, wireless and networking applications. In 1992, Dr. Lee received the award for outstanding accomplishments of a young engineer from the ASME Electrical and Electronic Packaging Division. Most recently, he received Freescale's Distinguished Innovator Award for his 10th issued US patent. Dr. Lee has over 100 conference and journal publications and has won Best Paper Awards of the 1998 IEEE ITherm, 2003 IEEE ECTC and 2005 ASME InterPACK conferences. Dr. Lee is a senior member of IEEE, IEEE CPMT, and in Oct. 2005, he was elected as an ASME Fellow. Dr. Lee has been an Associate Editor for the IEEE Transactions on Components and Packaging Technologies since 1994. He currently serves as the Program Chair of the 2006 IEEE ITherm Conference. His email is tom.lee@freescale.com.

Dr. Chia-Pin Chiu is manager of the Thermal Core Competency group at Intel Corp. in Chandler, Arizona, where he is responsible for thermal technology development and product thermal management. His major research includes thermal interface materials, thermal characterization metrology, and the development of new cooling solutions. Chiu received his M.S. and Ph.D. degrees in Mechanical Engineering from the University of Minnesota in 1992. After graduation, he jointed the ATD group of Intel and accomplished thermal designs for various Pentium processors. Chiu holds 24 US patents, 17 pending patent applications, and has published 35 technical papers. He is a member of ASME, IEEE, and the JEDEC JC15 committee. His e-mail is chia-pin.chiu@intel.com.

Dr. Mali Mahalingam received the Ph.D. degree in Physics from Carnegie-Mellon University. He is a Fellow of Technical Staff and Manager, in the RF Division of Freescale Semiconductor Inc. His current focus is high power RFPAs for wireless market. He has 27 years experience in the semiconductor industry of which the initial 25 years were with Motorola Inc. Mali has numerous contributions to both technology development and their successful implementation in products. He has many technical accomplishments in thermal, mechanical, materials, electrical, simulation/validation and computer-aided design (CAD) disciplines. Mali has many pioneering accomplishments in the thermal management technology in Motorola and has earned world-class recognition in this field. He has published 65+ technical papers including many (20+) in refereed technical journals and has won “best paper awards” from ASME/JSME. He has one issued patent and two filed. Mali has written contributory chapters towards technical books, has taught short courses at the universities & manufacturing plants, has organized and chaired technical conferences. He has mentored research at the universities and has won the "Mentor of the Year" award from SRC (Semiconductor Research Corporation). Mali has participated in national roadmap development for Semiconductor Industry Association. His email is mali.mahalingam@freescale.com.

Dr. Ravi Prasher currently manages the CPU cooling group at Intel. His group is responsible for the research and development of advanced cooling technologies for Intel CPU. Ravi received a B.Tech. degree from Indian Institute of Technology, Delhi in 1995, and Ph.D. in Mechanical Engineering from Arizona State University in 1999. He is also an adjunct professor in the Dept. of Mechanical & Aerospace Engineering at Arizona State University. Ravi has published approximately 30 archival journal papers, 35 conference papers and two book chapters in edited volumes. He currently holds 11 patents with 21 patent pending applications in the area of thermoelectrics, thermal interface materials, microchannels and heat pipes. Ravi is an Associate Editor of IEEE Transactions on Components and Packaging. At Intel he has led various projects in the areas of thermal interfaces, microchannel cooling, and heat pipes. His primary research and technology development interests are in using nano and micro systems to enhance the conductive, convective and radiative properties of materials including solids and liquids. His email is ravi.s.prasher@intel.com.

Date:	Wednesday, April 19th, 2006
Location:	Amphitheater (Located in Third Floor) Hilton Phoenix Airport, 2435 South 47th Street, Phoenix, Arizona - 85034 Tel: (480) 894-1600; Website: www.phoenixairport.hilton
Time:	12:00 PM – 1:00 PM Registration 12:50 PM – 5:30 PM Program 3:00 PM – 3:20 PM Refreshment Break
Cost:	$15 for IEEE members / $25 for Non-IEEE Members (Includes Tutorial Material and Refreshments)
Registration:	www.ieee.org/phoenix
Audience:	IEEE members and non-members all are welcome to attend.

For more information please call any of the following officers:

Vivek Gupta (480) 554-2195
Vasu Atluri (480) 554-0360
Vladimir Noveski (480) 554-2375

Debendra Mallik (480) 554-5328
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IEEE Components, Packaging and Manufacturing Technology Society
Phoenix Chapter

Wednesday, April 19th, 2006 Tutorial Meeting

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Dr. Ravi Prasher, Manager, Intel Corporation, Tempe, Arizona

Tutorial Registration at www.ieee.org/phoenix

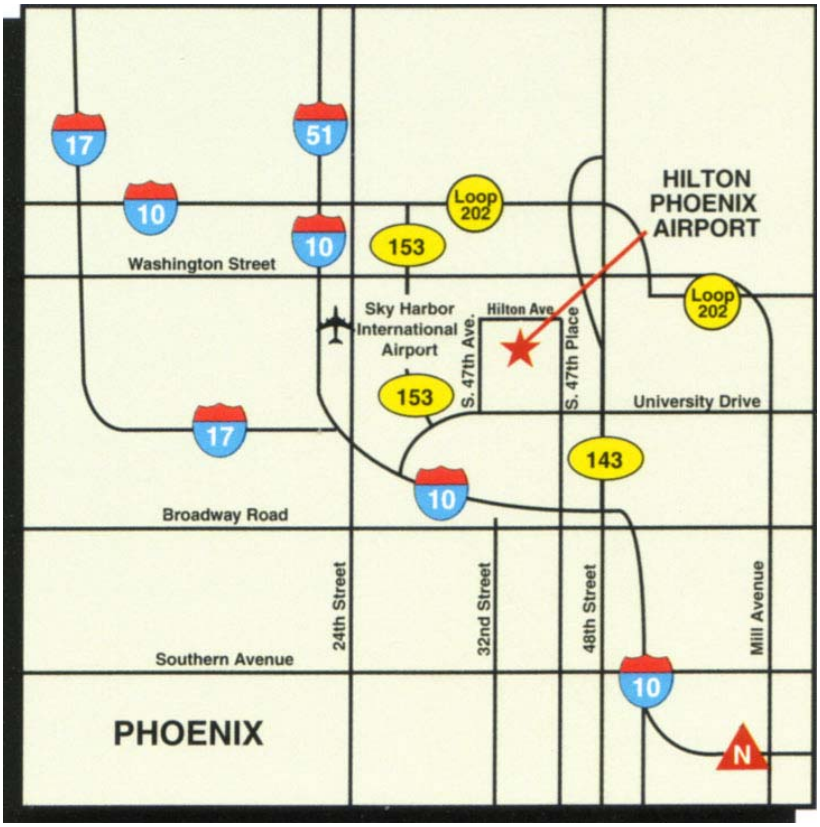
TUTORIAL LOCATION DETAILS

Hilton
Phoenix Airport

Hilton Phoenix Airport
is located at
2435 South 47th Street
Phoenix, Arizona 85034

West of 143 Freeway and North of University Drive

For Further Assistance Call
(480) 894-1600



IEEE Computer Society Phoenix Chapter

www.ieee.org/phoenix/compsociety

UPCOMING MEETING

Speaker: Dan Mazzola, Ph.D.

Topic: How To Be Employable

Date: Wednesday, April 5, 2006, 6:00-8:30 PM

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.

Sun Microsystems / W. P. Carey School of Business, ASU

This is a complex work world today. On the bright side, we have seen as strong surge in the demand for IT professionals lately. Google and eBay and alone are looking to hire almost 1,000 technology positions in Arizona during 2006. On the dark side, we have seen a disturbing trend of outsourcing, churn of old technologies in place of newer ones. Being employable is a state in which your marketability and ability to be in a position to make a difference does not depend upon the market. It depends upon you, and the person that you are being. This talk is for anyone that is looking for a first job, happy in the current job, or seeking a change. Bring your resume and your imagination.

During the past ten years, Dan has been responsible for developing and executing strategic sales and marketing campaigns in the fortune 1,000 accounts in Arizona. The role of Engagement Architect requires leading teams to present a unified faced for Sun Microsystems inside corporate accounts by merging the technology and vision with the business and financial requirements to deliver solutions in today's complex market environment. Dan is also responsible for evangelizing Sun Microsystems technologies and visions to the marketplace. In the last few years, Dan has been instrumental in developing strategic partnerships between Sun and the Arizona University, business, and government communities. One result has been in the two year partnership between Sun Microsystems and the Arizona Technology Council. In addition, Dan is currently consulting to new, very large employers in the Phoenix metro area.

One of the greatest methods for contributing to the next generation technology workforce is to contribute in its education. Dan has the unique opportunity to work in the technology industry by day, and teach undergraduate and graduate courses in the evening as an Adjunct Professor. He develops and delivers courses in Java Programming, J2EE, eb, Database, and Unix Technologies and applies them to real world requirements and experiences. Dan has teamed graduate students with Arizona companies in partnerships giving the students the opportunity to work in the corporate environment and apply their technical and business skills acquired in the classroom. He personally involves himself in the careers of the scholars by delivering job placement tutorials, interviewing skills, negotiation skills via regularly scheduled "How To Be Employable" seminars.

Next Meeting
To Be Announced
Speaker:
Topic:
Company:
Date: Wednesday, May 3, 2006, 6:00-8:30 PM

For more information about either meeting, contact c.vasquez-carrera@computer.org

OTHER EVENTS

1. Real-Time & Embedded Computing Conference

Thursday, March 30th, 8am – 3pm

Phoenix Airport Marriott Hotel

www.rtecc.com/phoenix

The event is **free** to IEEE members and is specifically designed for software and hardware engineers, project managers, R&D, and Directors of Engineering who are designing for the military & aerospace, telephony and datacom, industrial control, instrumentation, embedded appliances and more. Special conference presentations will feature PCI Express, VME, Embedded Linux, DSP, FPGA, Java, RTOS, SwitchFabric Interconnects, Wireless Connectivity and more. The exhibition will run alongside the open-door technical sessions for you to talk face-to-face with the vendors' technical experts.

2. Series On IT Success Strategies

Monthly Telephone Training Seminars

Contact Debbie Christofferson, from Sapphire-Security Services, at 480-988-4194 or DebbieChristofferson@earthlink.net Call in details will be sent after you register. The lines are opened up twice for audience questions, half-way through, and again, just before we conclude the interview. Attendees learn for the price of a one hour long distance call. The seminars are free of charge to IEEE Computer Society members who work with security. The seminars are opened to the first 100 people that register.

VIDEO GAMES

A stroll down the Video Game memory lane

Want to play those video games of your youth, or those games that came before you?

When: April 13th 7pm

Where: ASU Memorial Union

Room TBA, check website

Presented by:

IEEE GOLD Phoenix Chapter

IEEE GOLD Graduates Of the Last Decade

IEEE GOLD April Happy Hour

Graduates Of the Last Decade

Our first Happy Hour was a success! Come join us for another gathering to get out of the rain to socialize, learn about IEEE GOLD, meet our members, and eat some appetizers on us!*

When: Wednesday, April 19, 5:30 – 8:00 pm
Where: Four Peaks Brewing Company
1340 East 8th Street Tempe, AZ 85281
http://www.fourpeaks.com/
Look for us inside, in the back

Let us know you are coming!
Contact Peter Cioe (pcioe@.ieee.org)
RSVP not required but appreciated!

If you are an IEEE member who graduated with your first professional degree within the last ten years, you are automatically part of Phoenix IEEE GOLD! http://www.ieee.org/gold-phoenix

If you are not an IEEE member, learn about the advantages of becoming one! (In most cases your company will pay for your membership). Visit the Phoenix Chapter's website http://www.ieee.org/phoenix

* You do not need to be an IEEE member to come

IEEE GOLD Graduates Of the Last Decade

At the April meeting of the Phoenix Area Consultants Network:

MBA IN A DAY

Steven Stralser, Ph.D.,
Clinical Professor Global Entrepreneurship Center, Thunderbird: The Garvin School of International Management

Date: Thursday, April 13, 2006
Time: Networking begins at 6:30 p.m.
Dinner begins at 7:00 p.m.
Program starts at 8:00 p.m.
Place: Denny's Restaurant
3315 N. Scottsdale Rd.
Scottsdale, Arizona 85251

Abstract: Dr. Stralser will speak about speak about the importance of an effective business plan when launching a business. He is the author of the book "MBA In A Day : What You Would Learn At Top-Tier Business Schools (If You Only Had The Time!)", published by John Wiley & Sons. For a look at this book, copy and paste the following web address into your web browser: http://www.amazon.com/exec/obidos/tg/detail/-/0471680540/qid=1094145960/sr=1-4/ref=sr_1_4/104-5612972-4331905?v=glance&s=books

Recent reviews:
"MBA in a DAY: covers all the bases"...Phoenix Business Journal
"As preposterous as its title seems -- and, indeed, is -- this is a book to be taken seriously" National Post, Canada
"The recent addition to management literature "MBA in a Day", by Steven Stralser, PhD is one of the more clearly written and comprehensive regarding many management principles and theories." American College of Physician Executives
Directions: In Scottsdale, go west from Highway 101 and Indian School Road. Turn left on Scottsdale Road to head south. It is at the southeast corner on Scottsdale Road at Osborn Road.

Contact: Vaughn Treude
IEEE PACN President
vaughn@nakota-software.com

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

WAVES AND DEVICES PHOENIX CHAPTER

April 19, 2006 MTT-S Meeting

Terahertz Technology in Outer *and Inner* Space

Peter H. Siegel
California Institute of Technology Jet Propulsion Laboratory

Abstract

After more than 30 years of niche applications in the space sciences area, the field of Terahertz Technology is entering a true Renaissance. While major strides continue to be made in submillimeter wave astronomy and spectroscopy, the past few years have seen an unprecedented expansion of terahertz applications, components and instruments. Broad popular interest in this unique frequency domain has emerged for the first time, spanning applications as diverse as biohazard detection and tumor recognition. Already there are groups around the world who have applied specialized Terahertz techniques to disease diagnostics, recognition of protein structural states, monitoring of receptor binding, performing label-free DNA sequencing and visualizing contrast in otherwise uniform tissue. A commercial terahertz imaging system has recently started tests in a hospital environment and new high sensitivity imagers with much deeper penetration into tissue have begun to emerge. Solicitations for more sophisticated instruments and enabling terahertz components have filtered into US agency proposal calls from DoD and NASA, to NSF and NIH, and many new research groups have sprung up, both in this country and in Europe and Asia. This talk will broadly survey terahertz technology from its cradle applications in space science and spectroscopy to more recent biomedical and chemical uses.

Biography

Peter H. Siegel obtained a BA in astronomy and physics from Colgate University, Hamilton NY in 1976, a Masters in Physics and a PhD in Electrical Engineering from Columbia University in 1978 and 1983 respectively. He began his career in millimeter wave technology in 1975 as a summer student at the NASA Goddard Institute for Space Studies in New York City. In 1983 he moved up in frequency to the submillimeter, working as a National Research Council Fellow on THz planar antenna arrays. From 1984-87 Dr. Siegel was employed at the National Radio Astronomy Observatory where he worked with Sandy Weinreb and the millimeter wave receiver group in Charlottesville Virginia, maintaining the Kitt Peak National Radio Observatory. He moved to JPL in 1987 to work on advanced technology development for NASA astrophysics applications. At JPL, Dr. Siegel naturally became involved in several satellite instrument applications, including a very successful Earth observing platform that returned early data on the Antarctic ozone hole and chemical processes in the stratosphere. In 1993 he founded the JPL Submillimeter Wave Advanced Technology team (SWAT), a group of 20 to 25 engineers and scientists working on the development of submillimeter-wave technology for NASA's near and long term astrophysics, Earth remote sensing, and planetary mission applications. In 2002 Dr. Siegel joined the staff at Caltech as a Senior Scientist at the Beckman Institute, Division of Biology, where he is working on biological applications of THz technology. Dr. Siegel is a member of AAAS, an elected Fellow of the IEEE, Chair of IEEE MTT Committee 4 - Terahertz Technology and Applications, Vice-Chair of the International Organizing Committee of the Symposium on Infrared and Millimeter Waves (IRMMW), and Organizer of the 33rd IRMMW & 16th THz Electronics Symposium to be held at Caltech in Pasadena, California in 2008 – to which you are all invited!

Date: April 19, 2006
Location: Arizona State University, Main Campus, Goldwater Center (GWC) Room 487
See http://www.asu.edu/map/b2.html for more details.
Time: 3:00-4:00pm Presentation, Pizza & soda are being provided by the WAD Phoenix Chapter
For more information, please call Chuck Weitzel (Chapter Chair) at (480) 413-5906.

INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

WAVES AND DEVICES
PHOENIX CHAPTER

LEOS Meeting
April 7th, 2006

Tunable microring coupled lasers, electroabsoprtion modulators and issues related to thermal management of optoelectronic devices

Zhixi Bian
School of Engineering
University of California-Santa Cruz
zxbian@soe.ucsc.edu

Abstract: Optoelectronic integrated circuits are widely used in communication and in sensing applications. In this talk two high performance devices are introduced and issues related to thermal runaway and thermal management are discussed. We first introduce passive microring resonator coupled lasers (RCLs), which utilize the microring resonators as wavelength selector inside the laser cavity. Beam propagation simulations show that these devices can have a large side mode suppression ratio >50dB and a narrow linewith on the order of 3~500 KHz, which are better than the current state-of-the-art distributed feedback lasers. Using planar InP ridge waveguides and regrowth, the first monolithic double ring resonator coupled laser is demonstrated. A side mode suppression of 30 dB and a wavelength tuning range of 17 nm have been achieved. Electro absorption modulators are widely used in high speed optoelectronic transmitters. With the use of the thermoreflectance imaging technique, high resolution thermal maps of active electroabsorption modulators are obtained with submicron spatial resolution and <0.1C temperature resolution. A localized hot spot at the input of the modulator is observed under high input powers. Thermal runaway can increase the surface temperature by >150C in a region only 20 microns in diameter. A self-consistent finite difference modeling is developed which successfully explain the internal opto-thermo-electrical interactions inside the device. With improved thermal management of the electroabsorption modulator, a high power dissipation limit of more than 300 mW is achieved. For active temperature control of optoelectronic or electronic devices, thin film thermoelectric coolers could be used. To improve the cooling efficiency of conventional Si and III-V semiconductors, which are compatible with existing devices, low dimensional and nano structures are used to increase the thermoelectric figure-of-merit. An overview of the latest micro refrigerator devices will be presented.

Biography: Zhixi Bian is a researcher in the Quantum Electronics Group and Thermionic Energy Conversion Center at UCSC. He received his B.S. degree in Electronics from Nankai University in 1993 and M.S. degree in Electronics from Beijing University in 1996 respectively. He was with Physics department of Beijing University for three years. In 2004, he received his Ph.D degree in Electrical Engineering at University of California-Santa Cruz (UCSC). His current research interests include integrated optoelectronic circuits, heat and current transport in micro and nanoscale devices, energy conversion and renewable energies, and solid-state refrigeration for electronics cooling.

Date: Friday April 7th, 2006
Location: Arizona State University, Main Campus, Gold Water Center (GWC) Room 487
Enter the facility through the main (south) lobby and take the elevator to the fourth floor. Go north down the west hallway, the conference room is on the right. See http://www.asu.edu/map/ for map of campus.

Time: 5:00-6:00 pm Presentation
6:00 pm Discussion
Refreshments and pizza will be severed

ECTC 2006

The 56th Electronic Components and Technology Conference

May 30 – June 2, 2006
Sheraton San Diego Hotel & Marina
San Diego, California

Premier International Conference on Electronic Packaging, Components, and Microelectronic Systems Technology

- 38 Technical Sessions, including two poster sessions
- 16 Professional Development Courses
- Technology Corner Exhibits, featuring more than 70 industry-leading vendors
- Emerging Technology Sessions, including Biomedical, Nano-Scale and Organic Device Packaging
- Panel Discussion – 3D Interconnect
- Plenary Session – Packaging Solutions for Future Technologies
- Third iNEMI Workshop on Tin Whiskers
- CPMT Seminar on Advanced Substrate Technologies for SiP / SoP
- International Academic Workshop on Microsystems Packaging

More than 300 technical papers covering:

- Advanced Packaging
- Emerging Technologies
- Modeling & Simulation
- Optoelectronics
- Interconnections
- Materials & Processing
- Quality & Reliability
- Manufacturing Technology
- Components & RF

Don't miss out on the industry's premier event. For conference registration and information, please visit: **www.ectc.net**

ECTC Sponsors:

EIA Electronic Industries Alliance

EIA Electronic Components, Assemblies and Materials Association

CPMT

IEEE

IEEE International Performance, Computing, and Communications

April 10-12, 2006, Mesa Hilton Hotel, Phoenix, Arizona, USA

CALL FOR PARTICIPATION

We would like to cordially invite you to join us at the 25th IEEE International Performance, Computing, and Communications Conference (IPCCC) http://ipccc.org to be held in Phoenix, Arizona, USA, Mesa Hilton Hotel, on April 10-12, 2006.

For the past 25 years IPCCC is a premiere IEEE conference presenting research in the performance of computer and communication systems. Over the years, IPCCC has been a research forum for academic, industrial, and government researchers. This year, 2006, we are celebrating the 25th anniversary of the IEEE IPCCC. The conference will provide you with the new and original latest results on research in the performance of computer and communication systems. In addition, the following exciting events are planned as part of the conference: Keynote speeches, technical sessions, panels and half-day and full-day workshops.

We are looking forward to welcoming and seeing you in Phoenix!

Highlights of the IEEE IPCCC 2006 Conference

Two keynote speakers:

- Monday April 10, 2006
  "The Cell Phone and the Future of Mobile Computing"
  Prof. Roy Want, Principal Engineer, Intel Research, USA.

- Tuesday April 11, 2006
  "The Future of Traffic Grooming in Optical Communication Networks"
  Prof. Ahmed E. Kamal, Iowa State University, USA.

18 parallel technical sessions (April 10-12, 2005) covering topics in:

- Ad-hoc and Sensor Networks
- Multicast and Scheduling
- Traffic Measurement, Analysis and Engineering Information Assurance
- Wireless Networks
- Performance Evaluation
- Network Security
- Optical Networks

- Transport Layer
- Web Applications

Two Panels on:

- Providing Information Assurance in Next Generation Networks-organized by David Tipper, University of Pittsburgh, USA.
- WiMAX Standardization, Performance, Applications & Implications-organized by Mark Goldstein, President, International Research Center, USA.

Four workshops on Wednesday April 12, 2006:

- First International Workshop in Information Assurance
- WMSN'06: The Second International Workshop on Multimedia Systems and Networking
- eSCo-Wi'06: First International Workshop on eSafety and Convergence of Heterogeneous Wireless Networks
- Malware'06: First International Swarm Intelligence & Other Forms of Malware Workshop

For information about the technical program, registration, and hotel reservation, please visit the IEEE IPCCC 2006 Website at: http://ipccc.org

IEEE Power Engineering Society

invites you to attend the

2006 Substations Committee Annual Meeting

to be held at the

Doubletree Paradise Valley Resort

in

Scottsdale, Arizona

April 9-13, 2006

Visit http://ewh.ieee.org/cmte/ascm2006 for details

IEEE

Bruce Angwin Memorial Scholarship

First Prize: $5,000 **Second Prize: $3,000**

FOR HIGH SCHOOL JUNIORS GRADUATING IN 2007

This Scholarship honors the memory of Bruce Angwin, one of the pioneers who established the West Coast Electronics Show and Convention (WESCON) under the auspices of the Institute of Electrical and Electronics Engineers (IEEE), Region 6.

Scholarship awards are made available in August following high school graduation, and are paid directly to the college or university of the winners' choice after verification of registration for 12 semester credits in an approved field of study.

Winners will be honored at the 2006 Region 6 Awards Banquet. Flight arrangements and accommodations for one night will be provided for each winner and one accompanying adult.

RULES & ELIGIBILITY

1. The Bruce Angwin Memorial Scholarship program is open *only* to high-school JUNIORS.

2. Scholarships are limited to students who will major in electronics engineering or an *approved* associated field, at a four-year college or university.

3. The student applicant must be graduating in 2007, from a high school in AK, AZ, CA, HI, ID, MT, NV, northern NM, OR, UT, WA or western WY.

4. The student applicant must submit a 500-600 word essay, typed and single-spaced, with the student's name at the top of the first page.

5. A high-school administrator must sign the application form, affirming the student's eligibility.

6. A current high school transcript for grades 9 through the first semester of the applicant's Junior year must be submitted *with the application*.

ESSAY GUIDELINES

Describe in your own words: the importance of, and the future of, electronics engineering or an ***approved*** associated field in the United States. Your essay should describe what this field will offer to the next generation. It should also address how you will prepare for a career in that field, how you will contribute, and how you and others will benefit.

A reproducible application form is printed on the back of this announcement.

Send completed application, essay & transcript, postmarked **NO LATER THAN** May 1, 2006, to:

Dr. Gene Stuffle, Chair
Bruce Angwin Memorial Scholarship Committee
c/o Idaho State University
College of Engineering
833 S. 8th Avenue, Campus Box 8060
Pocatello, ID 83209-8060

*Questions? Visit our website at **http://coe.isu.edu/ieee/BruceAngwin** for more details, including sample essays from past competitions and a partial list of approved associated fields.*

*If you still have questions, or need to request approval of an associated field, contact **gene.stuffle@isu.edu**.*

Bruce Angwin Memorial Scholarship

Application Form

1. Name: _____
2. Street Address: _____
3. City: _____ State: _____ Zip Code: _____
4. Home Telephone: _____
5. E-Mail Address: _____
   (REQUIRED – This will be our primary means of communication with you.)
6. High School Graduation Date: _____
   (Must be in 2007.)
7. High School Name: _____
8. HS Street Address: _____
9. HS City: _____ State: _____ Zip Code: _____
10. HS Counselor's Name: _____
11. HS Counselor's Phone: _____ Fax: _____
12. HS Counselor's E-mail: _____
    (REQUIRED – In case we can't reach you any other way.)
13. College You Plan to Attend (if known): _____
14. Major Area of Study: _____
    (See Rule #2.)
15. Applicant's Signature: _____
    (My signature verifies that the enclosed essay is my own composition.)
16. High School Administrator's Signature: _____
    (My signature verifies that the applicant is a high-school junior, expected to graduate in Spring 2007.)

INSTRUCTIONS

PLEASE read the guidelines and instructions at http://coe.isu.edu/ieee/BruceAngwin before submitting your application.

Please print neatly and fill out the Application Form completely. The student applicant must sign on line 15, and a high-school administrator must sign on line 16. Enclose the completed form, together with your essay and a copy of your high-school transcript (grade 9 through the first semester of your Junior year) in an envelope, and send it to:

Dr. Gene Stuffle, Chair
Bruce Angwin Memorial Scholarship Committee
c/o ISU College of Engineering
833 S. 8th Avenue, Campus Box 8060
Pocatello, ID 83209-8060

Applications must be postmarked no later than May 1, 2006.