Chapter Meetings and Events

SCV-LEOS - 8/3: **"Directed Energy Weapons Systems"** - The future path for Directed Energy Weapons (DEW) may well transition to high power solid state lasers and these create a set of integration problems [more]

SCV-CNSV - 8/6: **"Entrepreneurs SIG"** - Part of the Consultants' Network of Silicon Valley, the SIG meets most weeks on Friday afternoon ... [more]

SF-PES - Aug 18: Summer Banquet: **"Electric Power: Demand Response Issues in California"** - Two speakers on the prospect of blackouts for the West Coast, what California is doing, and how Demand Response figures into the equation … [more]

SCV-SSC - 8/19: **"A Very Low Power CMOS Mixed-Signal IC for Implantable Pacemaker Applications"** - A single-chip, very-low-power IC for pacemaker systems uses new circuit techniques to achieve nano-power circuit operations with sub-micron CMOS processes ... [more]

SCV-WIE - 8/25: **"RFID: the Next Big Thing for the Retail Industry"** - Insights into the emerging technology of RFID and how it can be leveraged today with minimal enhancements to the current IT infrastructure ... [more]

SCV-CPMT – 9/13: **" Alternative Packaging Technologies for 3-D Packaging"** - the need for higher speed, smaller form-factors, and even cost are driving system packaging to explore the third dimension... [more]

Tutorials, Short Courses in the Bay Area

August 9 & August 13 – Santa Clara

Tutorials/Workshops at this year's EMC'04 ... **[more]**

Partial List

NARTE EMC Exam: Monday: Exam Prep Workshop – Friday: NARTE EMC Engineer Exam

PCB Design: Double-Sided and Multilayer: for the novice to intermediate product designer – PCBs that meet EMC requirements.

Fundamentals of EMC Design: designing circuits and systems with built-in compatibility – medical, military, communications, IT.

IEEE 802.11 Wireless: growth, future trends, and outlook; regulatory requirements; relationship to other technologies.

Fundamentals of Signal Integrity: intro to fundamentals; transmission line propagation, terminations, parasitics, modeling.

Plus a Dozen More

Reliability Engineering & CRE Exam Preparation Course

- Seven-week evening course in Santa Clara
- Starts **Tuesday, August 10th**
- Tuesdays from 6 - 10 PM (thru Sept 21)
- 25% discount for unemployed
- This course fills up quickly and seating is limited

For more information, send an email to **creprep@opsalacarte.com** or call 408-472-3889.

Upcoming Conferences in the Bay Area

August 9-13 – Santa Clara – EMC'04

IEEE Int'l **Symposium on Electromagnetic Compatibility (EMC'04)** **[more]**

EMC'04 Workshops **(**Monday and Friday) **[more]**

August 13-15 – Santa Clara – PSES'04

IEEE First Annual **Symposium on Product Safety Engineering** workshops, sessions **[more]**

August 16-19 on the Stanford University Campus:

IEEE **Computational Systems Bioinformatics Conference** Tutorials: Monday, August 16 **[more]**

August 23-27 – San Francisco – ICF'04

Int'l **Conference on Ferrites** **[more]**

Free admission to exhibits

August 25-27 – Stanford Univ – Palo Alto

Symp. on **High-Performance Interconnects** **[more]**

Two days of technical sessions and a day of tutorials

Sept 1-5 – San Francisco – EMBC'04

IEEE Int'l **Conference on Engineering in Medicine and Biology** **[more]**

Sessions, Workshops, Tutorials, Seminars

Sept 12-15 – Santa Clara Hilton

IEEE Int'l **SOC Conference**

Systems-on-Chip systems, architectures, circuits **[more]**

Sept 21-23 – Anaheim – WESCON'04

Wescon, NANOWorld, Enterprise Integration EXPO, exhibits **[more]**

Sept 27-30: Santa Clara Convention Center

GSPx: the International Embedded Signal Processing Conference and Exhibition

... Includes Executive Summit, sessions and workshops **[more]**

Oct 4-7: Santa Clara Marriott

SECON'04: **Sensor & Ad Hoc Communications and Networks --** Distributed arrays of devices & sensors – applications – tutorials, technical sessions **[more]**

Support our advertisers

MARKETPLACE – Services **page 26**

Conference Calendar **pages 23-25**

IEEE GRID

Your Networking Partner®

August 2004 • Volume 51 • Number 8

IEEE **GRID** is the monthly newsmagazine of the San Francisco Bay Area Council of the Institute of Electrical and Electronics Engineers, Inc. As a medium for both news and opinion, the editorial objectives of IEEE **GRID** are to inform readers in a timely and objective manner of newsworthy IEEE activities taking place in and around the Bay Area; to publish the official calendar of events; to report on IEEE activities of a national and international scope; and to serve as a forum for comment on areas of concern to the engineering community by publishing contributed articles, invited editorials and letters to the editor.

IEEE GRID is published as the **GRID** Online Edition residing at www.e-GRID.net, and in a handly printable **GRID.pdf** edition, and also as the **e-GRID** sent by email twice each month to more than 24,000 Bay Area members.

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From the editor . . .

Our main purpose, at the **GRID**, is to pull together the meeting information for all Bay Area Chapters in one place for you. Some Chapters have their own "publicity machines" but quite a few do not. We act as their voice to engineers around the Bay Area.

In addition to information about upcoming meetings, we run advertisements for conferences coming to the Bay Area and for seminars and workshops organized by local Chapters. There are four levels for this "paid placement" in the **GRID**:

1. For events financially sponsored by the Council itself (such as WESCON), we run the notices at no charge.
2. For seminars and workshops organized by local Chapters, or large conferences in which the local Chapter is at least a 5% owner, we offer half-price rates for our website's banner ads, "profiles" in the **e-GRID**, listing in our Interactive Calendar, and pages (or half-pages) in the **GRID.pdf**.
3. For IEEE Conferences that have no local financial sponsor, we charge 50% more than the preferential rates in (2).
4. Finally, for non-IEEE events, we have rates that are twice those available to local Chapters.

For more details (and if you're considering advertising with us), please see our flyer:
www.e-grid.net/docs/conf-flyer.pdf

Your local Chapters, your Section, and our Council get an allocation from IEEE (from your IEEE dues, etc) that covers something over half of our expenses – we use this for rebates to your Chapter for attendance at the evening meetings, support for Student Chapters, the K-12 program, operating the web site, helping to provide the Council Office in Palo Alto, and much more. Income from the advertisements we place on the pages of this GRID.pdf also go toward this "infrastructure" that provides a voice for all of our Chapters.

Send me your opinions on what we're doing!

Paul Wesling **editor@e-grid.net**

NOTE: This PDF version of the IEEE GRID – the **GRID.pdf** – is a monthly publication and is issued a few days before the first of the month. It is not updated after that. Please refer to the Online edition and Interactive Calendar for the latest information: **www.e-GRID.net**

International Systems-on-Chip Conference (SOCC'04)

- **September 12-15**
- **Santa Clara Hilton**

Systems-On-Chip (SOC) has become a dominant issue in today's ASIC industry. SOCs have created new challenges in Design Methods, Design Tools, Design Automation, Manufacturing, Technology, and Test. The IEEE SOC Conference provides a forum for sharing advances in SOC technologies and applications. SOCC is sponsored by the IEEE **Circuits and Systems Society**.

Technical Sessions:

- High-performance circuits and methodologies
- High-performance systems and architectures
- System level architecture and design
- Network processing architectures and circuits
- Low power architecture
- Low-power design
- Reconfigurable architectures
- Reconfigurable applications
- Analog to digital conversion
- Embedded systems
- Embedded processors for SOC
- Multimedia processors
- Multi-threshold circuits
- Deep-submicron design
- Digital signal processing
- DSP circuits
- On-chip testing of embedded silicon transducers
- Design for testability and reliability
- Analog circuits
- Wireless communication
- Interconnect modeling
- Issues of SOC

... plus a poster session, panel discussions, reception, vendor fair

Register before **August 13, 2004** to receive discounted rates.

Keynote, Plenary, and Luncheon Talks:

Keynote: **"Beyond Voice: The Third Generation of Wireless,"** Paul Jacobs, Executive Vice President and President, QUALCOMM Wireless & Internet Group

Plenary: **"Reviews and Prospects of Low-voltage RAM Circuits,"** Kiyoo Itoh, Fellow, Hitachi Ltd

Plenary: **"The Interconnect Era of ASIC/SOC Technology,"** James Meindl, Director, Microsystems Research Center, and Professor, Microsystems, Georgia Institute of Technology

Luncheon: **"IBM ASIC Design TAT Reduction,"** Jürgen Koehl, Distinguished Engineer, IBM Technology Group

Sunday Tutorials: (separate registration OK)

- Trade-Offs in RF Analog Circuit Design for SOC Applications
- SoC Design Methodology: A Practical Approach
- Substrate Coupling Noise and its Reduction through Early Design Planning in Mixed-Signal SoCs
- Heterogenenous Modeling of SoCs with System C using Multi-MOC Kernel of System C
- 90-nm SOI CMOS SoC Technology with Low-Power Millimeter-Wave Digital and RF Circuit Capability
- High-Performance CMOS Circuits for Sub-90nm Design

Vendor Fair (Tuesday evening):
A reception and Vendor Fair (held jointly with the Cadence Usergroup Conference) is open to all SF Bay Area engineers, on Tuesday evening; please see the website for a list of participating companies.

The 2004 **Int'l Cadence Usergroup (ICU) Conference** is also September 12-15 at the Westin Santa Clara Hotel (across the street from the SOCC events). Visit www.cadenceusers.org for more ICU Conference details.

International Cadence Usergroup

To Register, or for more information

Go to:
www.e-grid.net/conf/socc.html

or call Wendy at 301-527-0900 x104 for more information by phone.

GSPx: the International Embedded Signal Processing Conference and Exhibition

GSPx is specifically focused on embedded solutions — the only event created by the industry, for the industry. The Technical Program and Technical Workshops were developed to quickly immerse you in the latest technological innovations for embedded systems.

Key session themes
Analog & Mixed Signal Design – Architectures – Benchmarking – Cores – EDA & System Design Tools – Embedded H/W & S/W – FPGA-Based Solutions – Instrumentation and Testing – Modeling and Simulation – Parallel Processing – SoC Design

Application areas
Aerospace – Automotive – Biomedical – Consumer Electronics – Cryptography – Digital Filtering – Industrial Controls – Multimedia – Navigation – Power Management – Radar – Robotics – Software Defined Radio – Speech Processing – Telephony
... plus others

Tuesday, Sept 28
FREE: IEEE Professional Development Workshops
(free with a Conference or Workshops registration, or with the free Expo Pass – organized by **IEEE-USA**)
"**Taking Charge of Your Destiny: The New Rules for Career Success**," Nigel Bristow, Targeted Learning
"**Networking for Success**," Jean Eason, Consultant
"**Project Management**," Tarek Lahdhiri, Ph.D, P.E., General Motors Corporation

First-Look New Product Forum
GSPx features a session at which attendees will get a first look at exciting new products in the signal-processing and embedded-processing arenas. The competition between these new hardware and software products, not previously announced, is tough — last year's acceptance rate was around 15%.

Technology Panels
Digital Video Broadcasting to Mobile Terminals – OS-Agnostic Integrated Development Environments – Are Stand-Alone DSPs Passé? – Digital Radio – The Other System Design Language: MATLAB for DSP Design Automation – When Off-the-Shelf DSPs Won't Do: New Approaches to Drive DSP Solutions – On-Chip Interconnects for SoC's: Extend the Old or Embrace the New? – Ultra Wide Band: The Next Leap in Wireless? – DSP Intellectual Property Blocks: Boon or Bust? – Software Defined Radio: The Requirements, Challenges, and Regulation

- **September 27-30**
- **Santa Clara Convention Center**
- **Technical Sessions (over 500 papers)**
- **Workshops, Technology Panels**
- **Over 150 exhibitors of embedded hardware, software, tools**

Keynote Speakers (admission free)
Dr. Theo Claasen, Executive Vice President of Technology & Strategy and Chief Technology Officer, Philips Semiconductors
Ton H. Steenman, General Manager, Embedded Intel Architecture Division, Intel
Dr. Raul Camposano, Senior Vice President and Chief Technical Officer, Synopsys

Executive Summit (Tuesday and Wednesday)
Discover how to find and capitalize on opportunities in the re-evolving economy – invest accurately, get to the right markets under acute time pressure, and identify the most advantageous technology and market strategies. This Executive Forum assembles a diverse set of industry pundits, market makers, influencers and thought-leaders, from whom you will gain key insights that will affect your own success.

AM Workshops (separate registration OK)
"Real Time Operating Systems for DSPs and Heterogeneous Systems Containing DSPs"
"Using C to Implement Real-time Image and DSP Algorithms in FPGA & Programmable SoCs"
"Designing Advanced Wireless Applications with SPW"
"System-on-Chip Design Incorporating Silicon Hive Programmable Domain-Specific Accelerators"
PM Workshops
"Model-Based Design for Signal Processing Systems with Simulink"
"Efficient DSP Design for FPGA Implementation"
"ASIP Implementation of Advanced Wireless Applications with LISATek"
"Developing Handset Solutions Around The StarCore Family of Processors"
"FPGA Signal Processing"

To Register, or for more information, go to:
www.e-grid.net/conf/gspx.html

Register before **August 6** to save $200!

August 13-15, 2004
Santa Clara Convention Center

Conference Information

This symposium addresses safety engineering for equipment and devices, allowing engineers, students and others with an interest in electrical product safety to discuss and disseminate technical information and to enhance their professional skills.

- Talk to and discuss problems with vendors displaying the latest Regulatory Compliance products.
- Attend Technical Sessions, Workshops, Tutorials and Demonstrations specifically targeted to the electrical safety engineering professional.
- Registered PSES participants can also attend the TC-8 Workshop hosted by the EMC Society on Friday August 13, at no additional cost.
- Social event Friday evening, August 13.
- The PSES Symposium will immediately follow the IEEE Electromagnetic Compatibility Society's (EMC) annual symposium, at the same location.

Technical Program

Half-day Workshops

- EMC Effects on Functional Safety
- New Concept for Protection against Electric Shock
- Hazard-Based Safety Engineering (HBSE): Applying Engineering Fundamentals to the Design and Analysis of Products to Maximize User Safety
- One-day IEC Standards Workshop

Talks and Tutorials

- Product Safety in China, Singapore, Brazil, Argentina
- Product Safety Incident Investigations and Forensics
- Cemented Joints in Solid Insulation
- Designing for Safety -- How to Communicate with the Engineering Team
- Designing for Safety -- Heat Release Rates of Household Items
- Medical Product Design & Medical Standards
- CPSC: Who We Are and What We Do
- Outsourcing Product Design and Manufacturing
- Thermal Safety of Laptop Computers
- War stories by staff and attendees

Plus More

See the speaker and topic listing on the website

While product safety has been addressed in various committees over the years, there has never been a professional society or symposium solely devoted to product safety engineering, as a discipline, until now. Attend the first annual Product Safety Engineering Symposium and be a part of this important new direction.

REGISTER TODAY

Discount is allowed for registrants of EMC'04, being held earlier in the same week at the Santa Clara Convention Center. See **more information about EMC'04.**

Exhibit information

Judy Johnson, **judithej@shentel.net**

To Register, and for more information

Go to:

www.e-grid.net/conf/pses.html

or call Diana Krynski at 800 810 4333.

Sponsor:

PSES
Product Safety Engineering Society

In cooperation with:

The First IEEE Communications Society Conference on

Sensor and Ad Hoc Communications and Networks

- October 4-7
- Santa Clara Marriott

The convergence of the Internet, communications and information technologies, coupled with recent engineering advances, is paving the way for a new generation of inexpensive mobile devices, sensors and actuators. It is the distributed and ad hoc deployment of arrays of these network devices and sensors that bears promises for a significant impact, not only on science and engineering, but equally importantly on a broad range of applications relating to critical infrastructure protection and security, health care, the environment, energy, food safety, production processing, quality of life, and the economy.

This new IEEE Communications Society conference provides a forum to exchange ideas, techniques, and applications, discuss best practices, raise awareness and share experiences among researchers, practitioners, standards developers and policy makers in the field of sensor and ad hoc networks and systems. The conference is organized to provide for a degree of collegiality and continuity in the discussions of the various topics among participants from the industrial, governmental and academic sectors.

Tutorials

Tutorials are planned in the following topical areas:

- Security and Integrity Issues
- Mobility Issues
- Data Aggregation in Sensor Networks
- Localization Algorithms
- Operating Systems for Sensors
- Sensor Systems

Technical Session Themes:

- New architectures, protocols and access control to support communication, localization, time synchronization, routing and data dissemination
- Novel algorithms and theories for management, supervisory control and monitoring
- Industrial and commercial developments and applications
- Modeling and performance evaluation of large-scale distributed and ad hoc sensor networks
- Theories and models on fundamental information and communication aspects of wireless ad hoc and sensor networks
- Mechanisms for authenticated, secure communication and data dissemination in sensor and ad hoc networks
- Integration of sensors into engineered systems, including novel techniques for sensor renewable power sources, on-sensor self-calibration and self-testing
- Chip-based systems incorporating multiple sensors, computation, actuation, and wireless interfaces
- Software platforms, middleware and tools for ad hoc and sensor network applications development, deployment and management

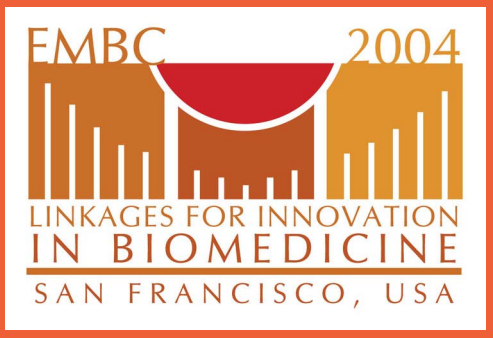
The Advance Program will be released during August. For more information, go to:

www.e-grid.net/conf/secon.html

26th Annual International Conference of the

IEEE Engineering in Medicine and Biology Society

September 1-5, 2004
Westin St. Francis Hotel
Union Square – San Francisco



The IEEE Engineering in Medicine and Biology Society will hold its annual international conference at the historic St. Francis Hotel on Union Square in the center of San Francisco in 2004. The conference offers an opportunity for professional interaction in all areas relevant to biomedical engineering. In addition to the technical programs, professional tours will be available, affording attendees the opportunity to visit local research facilities in both educational and industrial settings.

EMBC 2004 sessions address the following themes:

- Biosignal Processing and Biosystem Modeling
- Biomedical Imaging and Image Processing
- Sensors and Instrumentation
- Micro and Nano Biotechnology
- Biorobotics and Biomechatronics
- Bioinformatics and Computational Biology
- Healthcare Information Technology
- Clinical Engineering
- Drug Delivery and Gene Therapy
- Cardiovascular and Pulmonary Systems
- Neural and Rehabilitation Engineering
- Molecular, Cellular, and Tissue Engineering
- Biomechanics
- Industrial Applications
- Education

… plus 15 Mini-Symposia

REGISTER TODAY:

Student/Retired rate available

For full information and registration, visit the **EMBC 2004** website:

www.e-grid.net/conf/emb.html

KEYNOTE SPEAKERS

Paul C. Lauterbur, Nobel Laureate

2003 Nobel Prize in Medicine

Dr. Lauterbur is recognized as the father of MRI, and will share with us his experience of inventing the imaging principles for MRI as well as his views on interdisciplinary research.

Peter G. Katona, Sc.D.

President & CEO, The Whitaker Foundation

Dr. Katona will discuss the Whitaker Foundation's support of Biomedical Engineering and its impact on the development of the field.

WORKSHOPS and TUTORIALS **Wednesday, 9/1**

(Workshop-only registrations OK)

- Ethics in Biomedical Research
- Cardiorespiratory Variability: Models, Mechanisms
- Individual and Population Biomedical Models
- Computational Biology and Bioinformatics
- Level-Set Methods for Medical Imaging App'ns
- Medical Infrared Imaging
- Magnetic Resonance Imaging
- Biomedical Robotics and Biomechatronics
- Medical Image Analysis
- Microanalytical Devices for Bioprocessing
- Who/What Top Employers Hire
- Healthcare Wireless - Mobile Solutions in Hospitals
- Pulse Oximetry
- Project Management in a Regulated Industry
- Clinical Engineering Practices Review

… and more! Check website for scheduling details

Free admission to the Exhibits!

Exhibit Hours (Preregister, or register on-site)

Wednesday, Sept. 1	Noon-6 p.m .
Thursday, Sept. 2	8 a.m.-6 p.m.
Friday, Sept. 3	8 a.m.-6 p.m.
Saturday, Sept. 4	8 a.m.-5 p.m

Transportation: Park at the Union Street or Ellis O'Farrell garage, or ride BART or MUNI to the Powell Street station.

Ninth International Conference on Ferrites (ICF 9)

August 22-27, 2004
Cathedral Hill Hotel, San Francisco
Hosted by The American Ceramic Society
Technical Co-Sponsor: IEEE Magnetics Society

Conference Information

The 2004 International Conference on Ferrites (ICF) is the ninth in a series of conferences that provide a forum for the presentation and discussion of the latest scientific and technological developments in ferrites (magnetic ceramics) and related materials.

The conference will cover all areas of basic science and technology for ferrites and related materials. Special emphasis will be placed on advanced findings and emerging technologies that are expected to open new horizons for ferrites in the twenty-first century. More than 250 presentations on the results of academic, technical, and industrial studies will be given.

Technical Program

Science

- Physics of ferrites and related materials
- Chemistry of ferrites and related materials
- Crystal growth, sintering and microstructure
- Thin films, multilayers, and fine particles
- Other basic science

Processing and Applications

- Raw materials and manufacturing processes/facilities
- Soft magnetic materials and cores
- Hard magnetic materials and magnets
- Magnetic recording media, heads and systems
- Magneto-optics and applications
- High frequency and microwave ferrites
- Bio-magnetics and medical applications
- Power magnetics
- Transducers and sensors

Special Topics

- Nano-structured ferrites and related materials
- Magnetic & magnetorheological fluids, novel devices
- Multilayer chip inductors
- Other novel emerging technologies

Special Symposia

- Novel Applications and Materials for Electromagnetic Interference (EMI) Devices
- Application and Technology of Soft Ferrites
- Industrial Challenges for Soft Ferrite Producers
- Half Metallic Oxide Junctions and Highly Spin-Polarized Currents

Technical Tours

A tour of the Advanced Light Source at Lawrence Berkeley National Laboratory is planned for Wednesday, Aug. 25, 9:00 a.m. to noon. The cost of the tour is $25 and includes transportation. Buses will leave from the hotel at 7:30 a.m.

Social Program

Exhibits & Welcome Reception	Sunday, Aug. 22, 6-8 p.m.
Conference Banquet	Tuesday, Aug. 24, 7-9 p.m.
Wine Country Tour	Friday, Aug. 27, 8 a.m.-5p.m.

Exhibits and Sponsorships

This conference also offers the opportunity to interface with those potential customers who otherwise may be difficult to reach:

- Manufacturers of processing equipment
- Manufacturers of characterization equipment
- Designers and users of ferrite components
- Suppliers of ferrite materials

Exhibit Hours

Free admission to the Exhibits! (Register on-site)

Sunday, Aug. 22	6-8 p.m .
Monday, Aug. 23	10 a.m.-4 p.m.
Tuesday, Aug. 24	10 a.m.-4 p.m.
Wednesday, Aug. 25	10 a.m.-4 p.m.

To Register, or for more information

Go to:

www.e-grid.net/conf/icf.html

or call 614-794-5890 to register by phone.

Can't attend? Order the ICF-9 Proceedings.

September 21-23
Anaheim Convention Center

Welcome to the exciting new world of Wescon, combining exhibits with industry forums on OEM electronics, nanotechnology, supply chain management and net-centric defense industry manufacturing.

Wescon is the re-engineered industry event for the total design and supply chain. The Wescon/2004 Exhibit and Conference Program broadens its focus to the needs of the total supply chain for the electronics design, manufacturing and distribution process. IEEE, AFEI, NANOWorld and Wescon come together at a joint plenary session presenting new visions of where technology is taking us, today and tomorrow.

Wescon brings engineers and scientists together in an environment that advances their education and careers by opening doors to a wealth of intellectual property, a wide range of technology tools and components, and access to immediate solutions for commercial applications.

Some of the highlights:

EDA Tools & Engineering Software
Board Design and Layout Tools - Libraries and Design Management Tools - Supply Chain Management Tools - Design for Manufacturability Tools - Component/Interconnect Modeling

Test & Measurement Equipment
Stand-Alone Test Instruments - PC-based Instruments/Cards - Wired Telecom/Datacom Test - Fiber-Optic/Electro-Optic Test - RF/Microwave/Wireless Communications Test - EMC Test - Environmental Test - Software - Test Accessories and Services

Component Technology
Connectors and Interconnects – Semiconductors and ICs - Active and Passive Components - Power Components - Electro-Mechanical Components - Mechanical Packaging

The **Autonomous Vehicle Technology Showcase** is a new and exciting event focused on advanced technologies and their impact today and tomorrow, with 7 contenders from the recent DARPA Grand Challenge – includes an introductory workshop and sidebar briefings on the exhibit floor, covering mobility, processing, sensors, radar/ladar, data storage, GPS, mapping, algorithms, emergency stopping, and more. *free*

Wescon – owned by engineers and run by engineers to benefit engineers.

Held at WESCON in Anaheim, **NANOWorld** is the first nanotechnology conference and exposition devoted to commercial applications, practical solutions, and cutting edge products of the core technology that is driving the industry today and will dominate it tomorrow.

"By 2015, there will be new positions for more than 30,000 Engineers, Business Managers, Supply Chain Management and Educators to move nano-technology out of the labs and into commercial and government applications. We will no longer be a cottage industry. Attending NANOWorld 2004 is the first step towards getting the insight and training you will need for the nanotech world of the future."
… Dr. Anthony F. Laviano, NANOWorld Managing Director,
Member of the National Academy of Sciences,
National Research Council for Nanotechnology

Day 1: Nanomaterials and nanofabrication
Day 2: Nanocomponents
Day 3: Systems integration, use and applications

NANOWorld – the first event to go beyond theory into training and educating engineers in the commercial application of nanotechnology. It is the event that will make Nanotechnology a reality for you to explore.

Enterprise Integration EXPO 2004

co-located with Wescon – free admission

The Association for Enterprise Integration (AFEI), and **EI EXPO'04**, are focused on programs that address Network Centric Operations for government and industry – information-age business, network centric warfare, electronic government – building exceptional organizations through superior information capabilities based on building blocks of people, process and technology.

For more **Wescon**, **NANOWorld** and **EI EXPO** details, please visit:

www.e-grid.net/conf/wescon.html

Registration Form

Continued, next page ➔

Wescon Keynote and Plenary Talks (all free admission)

"Technology, Security and the Networked Economy"
Dr. Ray Wells, Chief Technology Officer, IBM Federal
Sean O'Keefe, Administrator, NASA
Dr. David Whelan, Vice President, Boeing Phantom Works

"Spintronics (what's spin got to do with it?)"
Kevin Roche, IBM Almaden Research Center

"Coming to Grips with Complexity in System Development - Collaborative Approaches Using Model-Based Design"
Jim Tung, Chief Market Development Officer, The MathWorks

"See Mars in 3D" - Randy Lindemann, Mars Lander Design, JPL

"Convergence of Nanotechnology, Information & Business"
Dr. Fredric Newberg, Lead Systems Architect, Sensoria Corporation
Keith Kellogg, Senior VP Homeland Security, Oracle Corp.
Tony Scott, CTO, Information Systems & Services, General Motors

Wescon Panels (all free admission)

"Managing Global Supply Chain Security" - Bruce Rayner, Editor-in-Chief, *Electronic Supply and Manufacturing* - Tom Mayhew, Oracle - Dan Purtell, President, First Advantage Corp - Dave Chesebrough, President, AFEI

"RFID in Action" - Bruce Rayner, Editor-in-Chief - Electronic Supply and Manufacturing - Mike Anderson, Oracle - Dan Allen, Director Marketing RFID, Texas Instruments - Bill Mullen, President, AIM

"Testing High Speed Communication Signals" - Rick Nelson, *Test & Measurement World* - Gregory Davis, Tektronix - Dr. Michael Lauterbach, LeCroy Corp

Technical Sessions (all free admission)

"Cost Based Risk Analysis and Performance Measures for Supply Chain Security" - Dan Purtell, President - First Advantage Corp (chair)

"RFID: The Adaptive Supply Chain" - Robert F. Kenney Jr. Senior VP, Logistics, i2 Technologies (chair)

"Structured ASICs – Don't Get Caught Between a Rock and a Hard Place" - Chung Ho, NEC (chair)

"Jitter Analysis of High Speed Signals" - John Calvin, Tektronix Inc.

"Getting More Out of Your Digital Oscilloscope" - Michael Lauterbach, Director-Product Management, LeCroy Corporation (chair)

"Overcoming Noise in Data Acquisition" - Joseph Ting, Product Manager, Yokogawa Corporation of America (chair)

"A 5-Year Power Technology Roadmap" - Chuck Mullett, Principal Systems Engineer, On Semiconductor (chair)

"Practical Considerations for Digital Control of Power Converters" - Kip Haggerty, H&A Systems Engineering (chair)

"The Changing Semiconductor Industry: Who's Going to be Left Standing Five Years from Now" - Ed Sperling, Editor-in-Chief, *Electronic News*

... plus 9 more!

Some of the Exhibitors at Wescon 2004

Use the **registration form** to receive **a free pass** to Wescon exhibits, pavilions, panels, sessions

Alpha Electronics Corp. of America
American High Voltage
Amphenol Military/Aerospace Industrial Operations
Anritsu Company
Astro-Med
BiPower Corp.
Boeing Co., The
Bomar Interconnect Products Inc.
C3D Development Corp.
Central Semiconductor Corp
Century Circuits and Electronics
CET TECHNOLOGY, Inc.
CKC Laboratories, Inc.
Conductive Technologies
CRC Press
Datamax Corp.
Dell Computer
Edac Power Ltd.
Educated Design & Development
Electro Rent Corporation
Emulation Technology, Inc.
Endicott Research Group
Enterra Solutions
Everbouquet Int'l Co., Ltd.
First Advantage Corp.
First Nano Inc.
Fischer Connectors
FLIR Systems
Fosta-Tek Optics, Inc.
Golden Pacific Electronics
Green Hills Software Inc
Hensley Technologies, Inc.
IBM Corp.
Information Handling Services
Intercon Systems, Inc.
Interpower Corp.
Ironwood Electronics
JAE Electronics
Jet Propulsion Laboratory
LeCroy Corp.
LPKF Laser & Electronics, Inc.
Marway Power Systems
Micro Precision Calibration, Inc.
Molecular Imprints, Inc.
Mouser Electronics
Multi-Contact USA
Mytech Corp.
National Wire & Cable
North Penn Technology.
Northrop Grumman
Northwest EMC
Olympus Industrial America, Inc.
Optical Polymers International
Renco Electronics, Inc.
RF Industries, RF Connectors
RF Installations
Schlegel Systems, Inc.
Signal Enterprises Inc.
SKS Die Casting
Skynet Electronics
Specialty Labs
SUNLED Corporation
Sunlike Display Tech. Corp.
Suyin Connector USA
TCC Industries, Inc.
Tech-Power International Co.
Tektronix, Inc.
TestEquity, Inc.
Tocos America
Toshiba America Information Systems.
Ultravolt, Inc.
Unisys Corporation
Unitrack Industries, Inc.
Victor Electronics
Virtual Standard
Pacific Aerospace & Electronics
Panel Components Corporation
Para Light Corp.
Phoenix Company of Chicago
Printed Circuits, Inc.
Prototron Circuits, Inc.
Rapid Prototyping Corp.

... and many more!

COMPUTATIONAL SYSTEMS BIOINFORMATICS

Bioinformatics Conference

Stanford, CA • August 16–19, 2004

CSB2004

CSB2004 is sure to be one of the key bioinformatics events in 2004, providing a broad spectrum of peer-reviewed, bioinformatics-related topics covering the breadth and depth of this dynamically evolving field. Our topic submission procedures, keynote speakers, paper and poster presentations, tutorials and social events have all been designed to cater to bioinformatics' eclectic mix of disciplines. **CSB2004** also has the lowest registration fees of any conference if its kind in the US, making it possible for everyone to attend. However, attendance is limited so please register early.

KEYNOTE SPEAKERS:

Philip Green, Ph.D.
Professor, Genome Sciences & Adjunct Professor, Computer Science and Engineering, University of Washington, Seattle

Benoit Mandelbrot, Ph.D.
Sterling Professor of Mathematical Sciences, Yale University, IBM Fellow Emeritus, IBM TJ Watson Research Center

Gene Myers, Ph.D.
Professor, Computer Science, University of California, Berkeley

Ron Shamir, Ph.D.
Professor, Computer Science Genetics Branch, Raymond and Beverly Sackler Chair in Bioinformatics, Tel Aviv University

INVITED SPEAKERS:

Hamid Bolouri, Ph.D.
Professor, Institute for Systems Biology

Michael Eisen, Ph.D.
Assistant Adjunct Professor of Genetics & Development, University of California, Berkeley, & Scientist, Life Sciences Division, Lawrence Berkeley Lab

Jim Kent, Ph.D.
Research Scientist, Baskin School of Engineering, University of California, Santa Cruz

Paul S. Meltzer, M.D., Ph.D.
Acting Chief and Senior Investigator, Genetics Branch, Head, Molecular Cytogenetics Section, National Human Genome Research Institute

Sandy Shaw
Vice President, Fractal Technology, Health Discovery Corp

Stephen Wong, Ph.D., PE
Director, HCNR Center for Bioinformatics, & Associate Professor, Department of Radiology, Harvard Medical School and Brigham & Women's Hospital

Bioinformatics - scientific and engineering disciplines bringing new biological discoveries to fields as varied as human health, agriculture, the environment, energy and biotechnology. Find out more at **CSB2004**

Who should attend:

Bioinformaticists, Biologists, Computer Scientists, IT Professionals, and Engineers who want to quickly learn about the evolving field of bioinformatics.

Location:

Held on the Stanford University campus, **CSB2004** is easily accessible to professionals living in the SF Bay Area and Silicon Valley.

See our website for driving and parking directions.

Sponsored by the IEEE Computer Society with corporate support of the Hewlett-Packard Company

"I think the next century will be the century of complexity." ...Stephen Hawking

For more Conference details including session titles, technical presentations, and on-line registration, please visit:

www.e-grid.net/conf/csb.html

Tutorials Offered on Monday, August 16

(as low as $100 – includes one AM and one PM)

MORNING SESSIONS
Introduction to Evolutionary and Functional Genomic Analysis
Tandem Mass Spectrometry in Proteomics
Use the Genome Browsers to Get the Most Out of Public Genomes
Computational Genetics: Haplotype Inference and Applications in Human Disease Gene Mapping
Intro. to Dynamic Programming & Its Applications to Bioinformatics

AFTERNOON SESSIONS
Bioinformatics: The Machine Learning Approach
Using dChip for Microarray and SNP Chip Data Analysis
Discovering Regulatory Networks from Gene Expression and Promoter Sequence
Computational Methods in Phylogenetics
From Sequence to Structure: Protein Structure Prediction

Listing of topics and instructors at

www.e-grid.net/conf/csb.html

World's EMC Experts Converge in Santa Clara this August

IEEE
INTERNATIONAL SYMPOSIUM ON ELECTROMAGNETIC COMPATIBILITY

August 9-13, 2004 – Santa Clara, CA
Santa Clara Convention Center

Join over 1,000 of the world's leading Electromagnetic Compatibility (EMC) engineers at the 2004 Symposium here in the Santa Clara Valley. For five full days, over August 9 to 13, EMC engineers will attend workshops and special sessions, hear technical papers presented by leaders in the industry, and view numerous experiments and demonstrations which are designed to put into practice the theory and applications learned in the technical sessions. In addition, over 200 exhibitors of EMC-related products and services will be on hand to present the latest technological advances in this industry. Engineers representing the diverse fields of telecom, automotive, and medical EMC will attend. The heart of Silicon Valley will also draw engineers working with printed circuit boards and integrated circuits. EMC design and test challenges are present across a wide range of industries.

The local Santa Clara Valley Chapter of the IEEE EMC Society organizes this symposium. Its steering committee members are from leading technology companies such as Cisco Systems, Hewlett Packard, Apple Computer, Lockheed Martin, and Underwriters Laboratories, among others. Chairman John Howard, a noted EMC Consultant, commented, "Not only will this year's symposium provide a great opportunity for engineers to attend cutting edge technical sessions, but it will also encourage the unique networking with fellow engineers that can only enhance one's career. No where else does this level of EMC technical expertise converge in one place at one time."

SYMPOSIUM AT A GLANCE - Sessions

PCB Analysis and Design
Shielding - Signal Integrity
Coupling - Lightning Protection
Filters and Conducted Emissions
Automotive EMC - System EMC
Gasketing and Grounding
Cables and Connectors

Test Facilities, Instrumentation
Reverberation Chambers
Immunity Testing
Radio Systems Interference
Wireless Testing SAR

Measurement Techniques
Computer Modeling
Model Parameter Determination
CAD Modeling and Extraction
Modeling & Simulation Validation
Modeling for Signal Integrity

FCC and Digital Devices
Standards and Regulations

Plus Experiment Demonstrations,
Committee & Standards Meetings

Introductory Level Workshops Offered

- 20 workshops, plus a NARTE exam prep session and the NARTE EMC Engineer exams
- Included with full conference registration, or register for only the "workshop" day you want

Listing of topics at **www.e-grid.net/conf/emc.html**

For more information on the **Symposium**, a complete listing of **exhibitors**, and **registration forms**, please visit:

www.e-grid.net/conf/emc.html

Note: attendees can select from **full-day** or **full-week** registration options.

Limited **exhibit space** may still be available; local exhibitors are welcome. Interested exhibitors should contact Sue Kingston at s.kingston@ieee.org for more information.

Current Exhibitors for the 2004 EMC International Symposium

Use the registration form to receive a free day pass to the EMC'04 exhibits

Exhibit Hours:
Tues & Wed August 10, 11 - 9:00am - 5:30pm
Thursday August 12th - 9:00am - 3:00pm

www.e-grid.net/conf/emc.html

(Print out and bring)

Exhibitors – – – – – – Booth numbers

3M Electronic Products Div.	701
3M Electronics Markets Mtls Div.	702
A. H. Systems	418
Acemark/Cherry Clough Consulting	705
Advanced Test Equipment Rentals	619
Agilent Technologie	824
AK Stamping Co.	710
American Assoc for Lab Accreditation	845
American TCB	944
AMIC (Advanced Mtls & Integration)	1045
Amphenol Canada Corp.	939
Amplifier Research	401
Andro Computationals Solutions	843
ANSI- ASC	C63
Antenna Research Assoc. (ARA)	516
Applied Simulation Technology	506
Arc Technologies, Inc.	419
Arnellabs	803
Avalon Equipment	505
Bay Area Compliance Lab	219
Braden Shielding Systems	924
California Instruments	320
Canon	1139
Captor Corporation	621
CKC Laboratories, Inc.	915
CMC Electronics/Cincinnati	808
Coilcraft	1040
Communications & Power Industries	936
Compliance Certification Services	1152
Conec Corp.	610
Conformity Magazine	523
Coteau Vert/NTT Advanced Tech	1143
Credence Technologies	716
CSA	1044
Cuming Microwave	804
D. L. S. Electronic Systems	1243
Dayton T Brown Inc	1034
Detectus	717
Dexter Magnetic Technologies, Inc.	601
Dynamic Sciences International	602
Educated Design & Development	615
EE - Evaluation Engineering	802
Electro Magnetic Test, Inc.	T-4
Electro- Magnetic Applications, Inc.	424
Elite Electronic Engineering, Inc.	1147
Elliott Laboratories	508
EM Software & Systems	1039
EMC Compliance Mgmt. Group	822
EMCIA (Nutwood UK Ltd)	706
emi- tec GMBH	948
EMS-Plus	T-9
EMSCAN Corp.	1136
ETH Zurich '05 Symposium	1711
ETS- Lindgren	301
Fair- Rite Products	515
Ferrishield Inc	723
Ferroxcube USA	507
Fischer Custom Comm'ns	316 415
Flomerics	911
Fotofab	943
G- Mag/ ETronic	609
Garwood Laboratories, Inc.	1047
Global Trading	937
Haefely EMC	501
HV Technologies	423
IBM	846
IEEE 2005 EMC Symposium	break area
IEEE EMC Society	1707
IEEE PSES Society	1710
Instruments for Industry	831
Intermark (USA) Inc.	932
International Certification Services	422
Isodyne, Inc.	818
Item Publications	1702
JDS Uniphase- OCLI Products	T-8
Johanson Dielectrics, Inc.	720
Kluwer Academic Publishers	1035
Laird Technologies	502
Leader Tech, Inc.	1133
Liberty Labs, Inc.	945
Magnetics, Div. of Spang	322
MAJR Products Corp.	224
MET Laboratories	920
Michigan Scientific Corp.	323
Micom Labs	817
Microwave Journal	T-11
MPE Ltd.	708
Murata Electronics N. A., Inc.	616
Narte Inc	522
National Instruments	917
National Technical Systems	606
Naval Surface Warfare Ctr, Dahlgren	801
NAWCAD	835
Nebraska Ctr -Excellence in Electronics	838
NEC/ Tokin America	712
NIST	421
Noise Laboratory Co. Ltd.	215
Northwest EMC	319
NTS	606
Ophir RF, Inc.	940
Optical Filters Ltd	324
Orion Industries, Inc.	519
Pacific Aerospace Electronics	503
PADS Japan Co., Ltd.	1138 1237
Panashield, Inc.	811
Panel Components Corporation	721
Pearson Electronics Inc	617
PPM Ltd	608
REO – USA	910
RF Installations, Inc.	718
RFI Corporation	922
Rogers Corp.	910
Rohde & Schwarz	201
Savcor Coatings	603
Schaffner EMC	315
Schlegel Systems, Inc.	916
Shieldex Trading	T-6
Schurter	820
Seven Mountains Scientific Inc	839
Siemic, Inc.	935
Sigrity Inc.	1048
Simlab Software GMBH	1144
Solar Electronics	1036
Southwest Research Institute	815
Specialty Silicon Products Inc	840
Spectrum Control, Inc.	1033
Spira Manufacturing	912
Steward, Inc.	847
Sunol Sciences Corp.	724 823
Taiyo Yuden USA, Inc.	810
TDK RF Solutions	834 933
Tech- Etch, Inc.	612
Technology International	510
Tecknit, Inc.	509
TennMax Inc.	321
TennRich Electronics	709
Test Equipment Corporation	711
Test & Measurement World	T-7
Thermo KeyTek	921
Thermshield LLC	504
TIMCO Engineering Inc.	620
Traxstar Technologies	719
TUV America, Inc.	216
Tyco Electronics Corp.	909
Underwriters Laboratories	1705
US Navy	837
Vanguard Products Corp.	816
Vishay Intertechnology, Inc.	622
W. L. Gore & Associates	715
Webcom Communications	T-5
WEMS Electronics	520
Wurth Elektronik USA	1043
Wyle Laboratories	844
X2Y Attenuators, LLC	848
Xemi	T-3
York EMC Services Ltd.	704

SCV Lasers and Electro-Optics

TUESDAY AUGUST 3

Directed Energy Weapons Systems

Speaker: Sam Williams, Chief Scientist, Lockheed Martin Space Systems Company
Time: Pizza Social 7:00PM, presentation 8:00PM
Place: National Semiconductor Credit Union Bldg 31, large auditorium, 955 Kifer Road, Sunnyvale
RSVP: RSVP@silicavalley.com
Web: www.silicavalley.com

Sam Williams was educated at Oxford University where he graduated with a degree in Engineering Science. He has worked in Electro-Optics for the last 25 years, in lens design, alignment methods for his impossible lens designs, and E-O system engineering. He is the holder of 3 patents and has presented a number of papers at SPIE and Optical Society meetings.

He is the chief Scientist for the Advanced DEW (Directed Energy Weapons) Systems organization at Lockheed Martin Space Systems Company and will talk about near term applications of Directed Energy Weapons Systems.

Weapon applications of high energy lasers have been studied in the US for the past 25 years. In the late 1970's, engineers at Hughes successfully demonstrated that a TOW missile could be destroyed with a Deuterium Fluoride laser with a less than 24 inch aperture telescope. During the past 20 years, there has been rapid development of systems for both tactical and strategic applications. NGST is developing the Theater High Energy Laser (THEL), based on the DF laser. Boeing, NGST and Lockheed Martin are developing the ABL (Airborne Laser), a chemical laser installed in a modified Boeing 747, for boost phase destruction of short and medium range missiles. The future path for DEW may well transition to high power solid state lasers and these create their own set of integration problems.

The presenter will discuss the requirements for DEW systems from the point of view of target vulnerability, atmospheric path and the beam control system. He will review the progress in DEW from the early years of ground based demonstrations to the projected systems that are being planned. The data presented has been derived from open literature sources and will consequently be unclassified.

Net-Centric Defense Industry Manufacturing

"With the enhanced involvement of the IEEE, it's about all the intellectual property that fuels the supply chain," says James Hungerford, President of Electronic Conventions, Inc. (ECI). Hungerford was of course talking about Wescon, which has been totally re-engineered for Fall 2004 at the Anaheim Convention Center, September 21-23, 2004.

The vibrancy of the exhibit hall will be enhanced by the co-location of AFEI (Association for Enterprise Integration) with its net-centric appeal to aerospace and defense industry executives, and even more by the two new Advanced Technology pavilions, one devoted to Autonomous Vehicles and one devoted to nanotechnology. IEEE visibility on the exhibit floor will include a Job Fair, access to the IEEE Digital Library, and presentation of IEEE's well-known 100 Years if Avionics exhibit. Other pavilions will cover Test and Measurement, Power Electronics, Design and Analysis, as well as the IPE component mix which has always been central to Wescon's success.

For more information, see this issue's **Wescon Pages**

Aug. 16-19 on the Stanford University Campus:
IEEE Computational Systems Bioinformatics Conference Tutorials: Monday, August 16

For more information, and to register online:

www.e-grid.net/conf/csb.html

SCV Entrepreneurs Special Interest Group

FRIDAYS AUGUST 6, 13, 20, 27

Weekly Meeting

Time: 3:00 - 5:00 P.M.
Place: NOVA Private Industry Council - CONNECT! Workshop Center
"Palo Alto" Room (inside 767)
505 W. Olive Avenue
Sunnyvale
Map: www.novapic.org/contact_us/

Info: For further information contact Art Rahman, Chair of IEEE CNSV, at ataur.rahman@worldnet.att.net
Web: www.ieee-sv-consult.org/

The Entrepreneurs SIG – a part of the Consultants' Network of Silicon Valley – meets most weeks on Friday afternoon. You are invited to attend.

For specific information, please contact the SIG chair, Art Rahman: ataur.rahman@worldnet.att.net

SF – Power Engineering

WEDNESDAY AUGUST 18

Summer Banquet

Demand Response Initiatives - Preventing Blackouts & Lowering Costs

Two talks:

"California Energy Policy and Its Impact on Demand Response"

Joe Desmond, Deputy Secretary of Energy, State of California

"Demand Response and Present Results of Recent Demand Response Experiments at LBNL"

Mary Ann Piette, Director, Demand Response Research Center, Lawrence Berkeley National Labs

Time: No Host Bar at 5:00PM; Dinner at 6:00PM; Presentations at 7:00PM

Place: Faz Restaurant, 161 Sutter St., SF, Tel: (415) 362 0404

Paid Parking (Flat fee of $10 after 5:00 p.m) at 223 Sutter St., a block south of Faz, and just steps from the Montgomery Street BART Station.

RSVP: Early Bird Special $30 before August 11th. $35 after August 11th. Students $15

- Deadline for all reservations is August 15th.
- Corporate Sponsors ($300 for table of 8)
- Walk-ins welcome (subject to availability)

Reserve using the PDF form at:

www.ewh.ieee.org/r6/san_francisco/sfpes.htm

Or call Curt Irwin, **415.973.8171**

Are we going to re-live August 14, 2003 (the Northeast Blackout) on the West Coast? What is California doing to avert "blackouts"? How does Demand Response figure into the "Supply-Demand" equation? What are the enabling Technologies? Is DR cost effective? How can YOU help? This year we have two distinguished speakers who can give you the answers.

In addition, we will be enjoying fine dining at the Faz Restaurant (www.fazrestaurants.com). Dinner is served Buffet style so attendees may enjoy a variety of entrees at a reasonable price!

This will be an enjoyable evening for engineers and non-engineers alike, so tell a friend. All are welcome!

SCV Solid State Circuits

THURSDAY AUGUST 19

A Very Low Power CMOS Mixed-Signal IC for Implantable Pacemaker Applications

Speaker: Louis S Y Wong, St. Jude Medical
Time: Refreshments are provided at 6:30 PM and the talk typically starts at 7:00 PM
Place: Cadence Bldg 5, 2655 Seely Ave, San Jose
Cost: $1 donation requested to partially cover food
RSVP: either call 408 894-2646 (leave a message) or by email to ssc_scv_rsvp@yahoogroups.com
Web link: http://www.ieee.org/scvssc/

Louis S Y Wong received the B.E. and 1st class Honours degree from The University of Adelaide, Australia, and the Ph.D. degree in electrical engineering from The University of New South Wales, Sydney Australia. During his Ph.D. and research program, he won The Australia Postgraduate Research Award and The IRE in Microelectronics.

In 1994-1996 he was with CSC Australia as a firmware engineer developing real-time embedded software for a defense combat system project. He then was with Cochlear Australia from 1997-2000 as a senior design engineer, where he was involved in research and development for a low-power mixed-signal single-chip solution for bionic ear implant devices. In 2000 he joined St. Jude Medical in Sunnyvale. He is currently a mixed-signal Design Manager and a Senior Principal Design Engineer, where he is responsible for designing the next generation of pacemaker ICs. Dr Wong was also a part time instructor at San Jose State University, teaching a CMOS IC design course.

His research area includes low-voltage low-power sub-threshold analog/mixed-signal and digital designs. He has filed and published numerous patents and papers in this area, such as with ISSCC, CICC, JSSC, and ISLPED. His design experience includes very low power A/D converters, battery power management systems, high-voltage charge pump in CMOS technology, radiation-hardened logic and memory, low power I/O cells, low power PLLs, and the lowest voltage D/A converter (0.9V) ever reported.

Pacemakers were first introduced in the 1950s, with only a few transistors used in the device. Technology has advanced and there are over tens of millions of transistors in today's implantable pacemaker system. A cardiac pacemaker is used to treat bradyarrhythmia (a heart rate that is too slow). This device monitors the heart's rate and rhythm, and provides electrical stimulation when the heart does not beat or beats too slowly. It is typically small in size, often less than an ounce in weight, and less than two inches wide. Once implanted inside the body, the pacemaker's presence is nearly invisible to the eye. Within the pacemaker device, there are (1) the integrated circuit and (2) a battery. The IC is a full custom mixed-signal sub-micron SOC (system-on-chip) containing all the circuitry necessary to operate a sophisticated device. It monitors the heart's rate and provides stimulation when necessary.

Low power consumption is crucial for a pacemaker IC. The fundamental goal is to provide a life span of up to 10 to 12 years. In this presentation, a single-chip, very-low-power interface IC used in implantable pacemaker systems is discussed. Many low power analog/digital design techniques have been utilized. A large variety of analog and digital circuitries have been integrated. It contains low-noise amplifiers, filters, ADCs (~280nW), the battery management system, a high-voltage charge pump (~400nW), high voltage D/A pulse generators, MEMS sensors and interface circuits (~120nW), programmable logic, and timing control. A few new circuit techniques are proposed to achieve nano-power circuit operations for sub-micron CMOS processes. For example, sub-threshold transistor designs and switched-capacitor circuits are widely used in the analog domain, and a large amount of clock-gating is used in the digital domain. The IC occupies 49mm^2, is fabricated in a CMOS multi-Vt process and consumes 8uW on average from a single 2.8V supply.

SCV Women in Engineering

WEDNESDAY AUGUST 25

RFID: the Next Big Thing for the Retail Industry

Speaker: Rohit Agarwal, IBM Labs
Time: 7 pm
Cost: free
Place: Boardroom, Cogswell Polytechnical College, 1175 Bordeaux Drive, Sunnyvale
RSVP: daisy_cheng@ieee.org
Web link: www.ieee.org/scv/wie

In this talk, Rohit gives a brief overview of RFID technology, followed by a discussion about demo/ pilot implementations done for some customers and how IBM's middleware products like DB2 Information Integrator, Websphere Business Integrator etc. are being used in the RFID solution. Business problems addressed by RFID implementation will be discussed in the presentation as well. Overall, this presentation will give our audience insight into the emerging technology of RFID and how it can be leveraged today with minimal enhancements to their current IT infrastructure.

Rohit Agarwal is currently a member of the DB2 Information Integration Development team. In his earlier roles he has worked with customers and partners to provide solutions for industry specific problems, involving IBM technologies. He was also instrumental in enabling DB2 Information Integrator access to various packaged applications to give DB2 II the ability to do federation over packaged applications such as SAP, Siebel, Peoplesoft, etc. He was one of the original team members responsible for the development of Connector for SAP R/3. He was working as a DB2 Database Administrator interfacing with different ERP software prior to joining IBM's Silicon Valley Lab.

RFID products, applications and technologies will sweep through the Wescon conference like a tsunami. Presentations, demonstrations and exhibits will address implementation, impacts, technologies and solutions.

A featured demonstration will be presented frequently during the three-day gathering by the Department of Defense. The product manager for Automatic Identification Technology will be responding to the effort for embedded RFID within the Army's Movement Tracking System, as well as the DoD mandate for components to have initial capability to read passive RFID tags by January 2005.

RFID supply chain issues will also be covered in presentations by Bruce Rayner, Editor-in-Chief of *Electronics Supply and Manufacturing Magazine*, and including executives of Oracle, Texas Instruments, AIM (Association for Automatic Identification and Mobility), in panel discussions of the impact of RFID on supply chains. i2 Technologies will present a program on the adaptive supply chain and its use of RFID to transcend functional boundaries between engineering, marketing, sales, etc. Wescon will both feature exhibits on passive and active tags, IT infrastructure integration, and strategic business impact.

Tuesday, Wednesday, Thursday – September 21-23

Registration is free for all of the RFID programs and for much more!

For more information, see the **Wescon information pages** in this issue of the GRID.

IEEE, REGION, and COUNCIL NEWS

Would you like to be associated with a neighboring Section?

Your IEEE mailing address automatically determines your Section affiliation – eg, SF, OEB, or SCV. However, you may choose to affiliate with a neighboring Section instead of the one assigned. This is a common request from commuters who live near Section boundaries.

Once the change is made, you will receive meeting notices, newsletters (and the **e-GRID**), and other information from the new Section, and only that Section. You will be on the new Section's roster with the mailing address provided. Contiguous Section affiliation status remains on your record until such time as it is manually removed. If you relocate out of the area contiguous to the Section assignment requested, you will be automatically reassigned to the appropriate Section.

To make a request for change of Section affiliation, you can send an email to **contiguous@ieee.org**. The email must include name, member number, current Section and the Section with which you wish to be affiliated.

SOUTHBAY VOLUNTEERS NEEDED FOR SCV PROFESSIONAL ACTIVITIES COMMITTEE

Tom Coughlin, Silicon Valley PACE Co-Chairman

The Santa Clara Valley Section PACE committee has been pretty busy this year. We need more volunteers to continue and expand our activities to promote engineering professionalism and create support systems for local IEEE members. Besides the traditional PACE activities such as professional engineering training, science fair assistance, and political activities, we have been working to create a local PACE group that is more responsive and pro-active to meet the needs of local IEEE members. Towards that end we have begun an effort to deal with **unemployment of local engineers**. This activity started with a "heart-felt" letter that was sent out to all the SCV IEEE members. You may have read this letter, how it was composed, and the results in a **prior GRID article**. To summarize, we received a very strong show of support by IEEE members, including those working in area companies that were looking for employees. As a result of the responses we created a local IEEE employment web site, **www.ewh.ieee.org/r6/scv/,** that includes a listing of job openings, a copy of the "heart-felt" letter, and a list of hiring companies with internal IEEE contact people.

In early July we sent out a version of this letter to national, state and local political representatives. As of this date we have received responses back from the offices of Mike Honda and Barbara Boxer. They indicated support for efforts to increase hiring of local engineers.

We are developing our plan to help local engineers further. In late June Tom Coughlin, SCV Pace Co-Chair, made a presentation before the Silicon Valley Engineering Council (SVEC) about engineering outsourcing and a proposal to create mid-career engineering internships to help local engineers transition to new fields that are looking for experienced engineers with some training in these new areas but needing actual industrial experience. The material in the presentation was jointly put together by Lee Colby and Tom Coughlin. Some of the material from the presentation came from Ron Hira of the Rochester Institute of Technology and was obtained by Lee Colby during the Engineering Fly-In to Washington in the spring. We will be putting this presentation on the website listed above so others can see it.

As a result of that SVEC meeting Sam Haddad, one of the founders of the SVEC (who was present at the meeting), introduced Jim Pinson to Tom as the former Dean of Engineering at San Jose State University and an experienced engineering training resource. Jim was contacted and agreed to be an advisor for a plan to create an engineering retraining program and mid-career engineering internships. The SCV PACE group is looking at pooling its resources with SVEC and other interested South Bay engineering groups to create such a program.

The SCV PACE group is also exploring the idea of **creating audio/Powerpoint webcasts** of local IEEE events and seeks volunteers to help set this capability up.

This brings us to the **need for more volunteers** to help us with our regular PACE activities as well as our efforts to improve the employment opportunities for IEEE members in the South Bay. These activities will only be possible with additional volunteers. To find out about our next meetings and to get involved with our activities please contact Tom Coughlin at **tom@tomcoughlin.com**. You can also join our IEEE PACE email group by sending an email to **scv-pace-subscribe@yahoogroups.com** and responding to the email response to set up your membership options.

Tom Coughlin
Co-Chairman, SCV Pace

IEEE Education Society Chapter:

First Meeting in Silicon Valley

The Silicon Valley Chapter of the IEEE Education Society was formed recently, as a result of a petition effort initiated by Lili He of San Jose State University. The goals and objectives of the Education Society are to advance the theory, practice and accessibility of engineering education and to assist in achieving overall IEEE goals. The 1st meeting of the chapter was successfully held on May 26th at the Silicon Valley Technical Institute. Chapter officers were selected from the meeting attendees as follows:

- Chair: Lili He, San Jose State University
- Vice Chair: Ali Iranmanesh, Silicon Valley Technical Institute
- Treasurer: Jayasimha Prasad, Maxim
- Secretary: Jin Zhao, Sigrity
- Web Master: Jin Zhao
- Programs Chair: Khosrow Lashkari, Silicon Valley Technical Institute

The chapter meetings will be held on the 3rd Wednesday of every month at Silicon Valley Technical Institute. It was also decided for the chapter to actively develop technical and informational meetings for the benefit of all IEEE members and working professionals who have a particular interest in education in electrical, electronic, and computer engineering.

Officers of the newly formed Silicon Valley Chapter of the IEEE Education Society. From left to right; Jin Zhao, Lili He, Jayasimha Prasad, Jonathan David (from the IEEE SCV Section), Ali Iranmanesh, Khosrow Lashkari.

For anyone interested in joining the steering committee of the new IEEE Education Society SCV Chapter, the contact information is: **lhe@email.sjsu.edu** and **Alii@svtii.com**.

Passing the Stress Test

Papers piling up, deadlines looming, a good night's sleep hard to come by, that constant uneasy feeling of being overworked and under the gun. As we work more and more, we spend less and less time on our personal affairs, and on just relaxing and enjoying our lives. It's a sure recipe for stress. What can we do about it? Surprisingly, a lot, writes IEEE Spectrum columnist Carl Selinger. Here's what he has to say about how to make your work life less stressful, and more fun:

www.spectrum.ieee.org/careers/careerstemplate.jsp?ArticleId=c070104

From IEEE SOCIETY SENTINEL - Vol. 9, No. 13

RECOMMENDATIONS FOR 2005 APPOINTED TAB COMMITTEE MEMBER POSITIONS

The TAB Nominations and Appointments Committee is seeking recommendations for the following positions, which will be appointed by the 2005 VP- Technical Activities in conjunction with the November Organizational Unit Series. These positions are for one-year terms unless indicated.

- RAB/TAB Section/Chapter Support Committee Members - total of three (3) positions. Of these, one is a present or past S/C President; one is a present or past Division Director and one is a member from Regions 7-10.
- TAB Strategic Planning and Review Committee Members - total of two (2) positions, each for a three-year term (2005-2007). Of these, one is a present or past S/C President, and one is a present or past Division Director.
- Transnational Committee Members - two (2) present or past TAB members (The charter notes there is a maximum of 4 members who can be appointed)

Representatives to IEEE Entities

- IEEE Awards Board (1) - Division Director at time of service;
- IEEE USA Awards and Recognition Committee (1) - Member grade and above;
- IEEE Membership Development Committee (2) - Member grade and above;
- IEEE Regional Activities Board (1) - Member grade and above;
- IEEE Standards Board (1) - Member grade and above;
- IEEE Student Activities Committee (1) - Member grade and above;
- Washington Internships for Students of Engineering (1) - Member grade and above;
- IEEE Educational Activities Board (2) - Member grade and above, having strong interest in engineering education from Technical Activities;
- Women in Engineering Committee (1) - Member grade and above;
- Graduates of the Last Decade (GOLD) (3) - one a S/C President or DD at the time of service, one a member from Regions 7-10 and one Member grade and above;
- EAB/RAB/TAB Reference List of Educational Programs Committee (3) - Member grade and above. Individuals should be cognizant of existing and emerging disciplines, fields, areas and specialties of interest to the IEEE.
- In addition, the TAB Nominations and Appointments (N&A) Committee will continue to accept nominations for the position of 2006 TAB Vice President-Elect until 6 September 2004, to be considered for the final slate prepared by the TAB N&A

Committee and presented to TAB at the November 2004 TAB meeting. After this time, the petition process must be followed. The deadline to notify the Managing Director of Technical Activities of the intent to petition is 11 October 2004. Nominations will not be accepted from the floor at the November meeting for this position. The slate of candidates approved by TAB will appear on the ballot for the 2005 IEEE election. This individual will serve as the TAB Vice President-Elect in 2006, as TAB Chair in 2007 and as Past Chair of TAB in 2008. Each of these positions includes services as a member or chair of other TAB and IEEE committees. Candidates for TAB Vice President-Elect must be of Fellow or Senior Member grade, and maintain membership in at least one IEEE Society.

To request a recommendation form and/or to obtain additional information on the functions of each TAB Committee, or discuss a TAB VP-elect nomination, CONTACT Paula Dunne - IEEE Technical Activities - telephone +1 732 562 3919; **p.dunne@ieee.org**.

First Annual IEEE Symposium on Product Safety Engineering

in Santa Clara – August 13-15

While product safety has been addressed in various committees over the years, there has never been a professional society or symposium solely devoted to product safety engineering, as a discipline, until now. Attend the **first annual Product Safety Engineering Symposium** and be a part of this important new direction. It's here – locally – in Santa Clara.

This symposium addresses safety engineering for equipment and devices. It allows engineers, students and others with an interest in electrical product safety to discuss and disseminate technical information and to enhance their professional skills.

- Talk and discuss problems with vendors displaying the latest Regulatory Compliance products.
- Attend Technical Sessions, Workshops, Tutorials and Demonstrations specifically targeted to the electrical safety engineering professional.

More information:

www.e-grid.net/conf/pses.html

CONFERENCE CALENDAR

Aug. 9-10: **Workshop on Memory Design and Testing will be in San Jose**

The workshop (MTDT'04) covers all aspects of memory design, process technologies and testability related topics, such as memory circuit designs, cell structures, fabrication processes, design architectures and related testing and verification methods for SRAM, DRAM, Flash and non-volatile memories, EPROM, EEPROM, embedded memories, logic-enhanced and FIFO memories, 3-D memories, and content addressable memories. For more information, contact Rochit Raysuman, 408 727 2222, r.rajsuman@advantest-ard.com

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Aug 9-13: **IEEE Int'l Symposium on Electromagnetic Compatibility held in Santa Clara**

Attend workshops and special sessions, hear technical papers presented by leaders in the industry, and view numerous experiments and demonstrations which are designed to put into practice the theory and applications learned in the technical sessions. Visit with over 200 exhibitors of EMC-related products and services. See our **GRID display pages.**
For registration information, see the website:

www.e-grid.net/conf/emc.html

Aug 13-15: **IEEE Symposium on Product Safety Engineering Held in Santa Clara**

This symposium addresses safety engineering for equipment and devices. It will allow engineers, students and others with an interest in electrical product safety to discuss and disseminate technical information and enhance their professional skills. Talk and discuss problems with vendors displaying the latest Regulatory Compliance products. Attend Technical Sessions, Workshops, Tutorials and Demonstrations specifically targeted to the electrical safety engineering professional.

See our **GRID display page** for more details.
For registration information, see the website:

www.e-grid.net/conf/pses.html

Aug. 16-19: **IEEE Computational Systems Bio-informatics comes to Stanford in August**

CSB2004 is one of the important bioinformatics events and provides a broad spectrum across the bioinformatics field. Our keynote speakers, paper and poster presentations, tutorials and social events have all been designed to cater to bioinformatics' eclectic mix of disciplines. CSB2004 has the lowest registration fees of any conference of its kind worldwide to make it possible for everyone to attend. And this year it is in our own "back yard."

The tutorials will be given on Monday, August 16, offering the opportunity to learn about new areas of bioinformatics research, get an introduction to important established topics, and/or develop higher skill levels in areas for which they are already knowledgeable. See our **GRID display page.**

For more information, and to register online:

www.e-grid.net/conf/csb.html

Aug. 22-24: **Hot Chips Symposium at Stanford**

The IEEE Symposium on High Performance Chips (**HOT CHIPS 16**) will be held in Stanford's Memorial Auditorium with tutorials on Sunday followed by two days of paper presentations on Monday and Tuesday. For designers and architects of high-performance chips, software, and systems, the presentations focus on up-to-the-minute real developments. This symposium is the primary forum for engineers and researchers to highlight their leading-edge designs. For more information, visit the Hot Chips website: www.hotchips.org.

Aug. 23-27: **Int'l Conference on Ferrites in S.F.**

ICF'04 provides a forum for the presentation and discussion of the latest scientific and technological developments in ferrites (magnetic ceramics) and related materials. The conference covers all areas of basic science and technology for ferrites and related materials. Special emphasis is placed on advanced findings and emerging technologies that are expected to open new horizons for ferrites in the twenty-first century. More than 250 presentations on the results of academic, technical, and industrial studies will be given. Exhibits give the opportunity to visit with suppliers.

See our **GRID display page** for more details.
For more information, and to register online:

www.e-grid.net/conf/icf.html

Aug. 25-27: **Symposium on High Performance Interconnects being held at Stanford**

HOT INTERCONNECTS 12 brings together designers and architects of high-performance chips, software, and systems at the University and global business levels. Presentations focus on up-to-the-minute developments demonstrating leading-edge designs by engineers and researchers throughout the world. Two days of technical sessions and a day of tutorials will keep you on top of the latest developments within industry and academic laboratories. Free parking on the campus!

See our **GRID display page** for more details.
For more information, and to register online:

www.e-grid.net/conf/hoti.html

Sept 1-4: **Conference on Engineering in Medicine and Biology Visits San Francisco**

The IEEE Engineering in Medicine and Biology Society holds its annual international conference at the historic St. Francis Hotel on Union Square in the center of San Francisco. The conference offers an opportunity for professional interaction in all areas relevant to biomedical engineering. In addition to the technical programs, professional tours will be available, affording attendees the opportunity to visit local research facilities in both educational and industrial settings. Workshops and tutorials are on Wednesday, 9/1, and local engineers may register for only the workshops. Keynote speaker is Paul C. Lauterbur, 2003 winner of the Nobel Prize in Medicine. Extensive exhibits are free to Bay Area professionals.

See our **GRID display page** for more details.

For more information, and to register online:

www.e-grid.net/conf/emb.html

Sept 13-15: **IEEE Petroleum and Chemical Industry Conference in San Francisco**

PCIC provides an international forum for the exchange of electrical applications technology related to the petroleum and chemical industry. PCIC attracts national and international participation. Held at the SF Marriott, the conference includes technical sessions, tutorials, and subcommittee meetings. Contact local committee chair Ken McFarland (Ken.McFarland@Crouse-Hinds.com) or visit the website:
www.ieee-pcic.org/Conferences/2004_San%20Francisco/

Sept 12-15: **Systems-on-Chip Addressed at IEEE SOC Conference (SOCC'04) in Santa Clara**

Sponsored by the IEEE CAS Society and held at the Santa Clara Hilton, the SOCC provides a forum for sharing advances in SOC technologies and applications. Systems-On-Chip (SOC) has become a dominant issue in today's ASIC industry and has created new challenges in Design Methods, Design Tools, Design Automation, Manufacturing, Technology, and Test. There are four days of tutorials, technical sessions, keynote talks, and vendor exhibits. See our **GRID display page** for more details, or visit

www.e-grid.net/conf/socc.html

Sept 21-23: **Wescon comes to Anaheim this year, with NANOWorld, EI EXPO, plus more**

The re-engineered Wescon/2004 brings together the technical programs of **NANOWorld**, the **Enterprise Integration EXPO**, the **Autonomous Vehicle Technology Showcase**, the Micromouse Competition, a Job Fair, and more. Vendor exhibits include pavilions on test and measurement equipment, components, RFID, EDA tools, engineering software, power components, and net-centric manufacturing integration. Best of all, the exhibits pass and most events are free; separate low-cost registration is required for NANOWorld and for Tutorials.

See our **GRID display pages** for more details, and the **Exhibits Registration Form** in this GRID.

For more information, visit the website:

www.e-grid.net/conf/wescon.html

Sept 27-30: **GSPx: the International Embedded Signal Processing Conference and Exhibition**

Held at the Santa Clara Convention Center, GSPx is specifically focused on embedded solutions, with a Technical Program and Technical Workshops covering the latest technological innovations for embedded systems. This year it includes an **Executive Summit** and exhibits. See our GRID display page for more details. For more information, visit **www.e-grid.net/conf/gspx.html**.

Oct 25-29: **BroadNets 2004 covers Broadband Networking in San José**

The IEEE Communications Society's first International Conference on Broadband Networks will be held locally at the end of October, with its focus on broadband networking for the entire gamut of next-generation networks – all the way from access networks (xDSL, Cable, EPON, Broadband Wireless, multi-Gigabit uplinks), to regional and metropolitan networks to wide-area core networks. Visit the website: www.broadnets.org.

Oct 7-8: LEOS Workshop: **SBIR Grants for the Curious Engineer in Business**

The US government and other domestic agencies provide funding for projects and assistance for R&D to small businesses under the Small Business Innovative Research (SBIR) program. Funds from tens to hundreds of thousands of dollars are available for work on topics ranging from nanotechnology to astronomy.

This workshop is for engineers, entrepreneurs, and small-business executives who wish to learn how to "read between the lines" of government solicitations and how to win grants and contracts. This two-day Workshop will be held in Sunnyvale, at the National Semiconductor Credit Union meeting rooms. More details: www.ieee.org/sbir/

The **CONFERENCE CALENDAR** is a service to our IEEE Members. It outlines upcoming IEEE workshops and conferences in the Bay Area. Please submit items to the GRID Editor: editor@e-grid.net.

Conferences are also encouraged to purchase display space in the **GRID.pdf** and publicize their events on our website and in our **e-GRID** email notification service. For the Conference Publicity flyer, please download:

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9-94566

1.

First Name _____ Last Name _____

Job Title _____ E-mail _____

Company _____

Mailing Address _____ Mail Stop _____

City _____ State _____ Zip _____ Country _____

( ) _____ ( ) _____

Telephone Fax

How to Register

Mail Deadline - August 20, 2004
Weson/2004
1230 Rosecrans Ave., Suite 100
Manhattan Beach, California 90266

FAX Deadline - September 16, 2004
310-643-7328
Please do not both fax and mail.

Electronically www.wescon.com
After August 20, 2004 badges will be held for pick-up at the advance registration counter.

On-Site
Bring this form with you to Wescon/2004 for FREE admittance.

2. Principal Job Function
(check only one)

- ☐ AA Engineer - Design
- ☐ AB Engineer - Manufacturing
- ☐ AC Engineer - Quality/Test
- ☐ AD Engineering Services
- ☐ AE Engineering Management
- ☐ AF Corporate/General Management
- ☐ AG Press
- ☐ AH Purchasing/Procurement
- ☐ AJ Marketing/Sales
- ☐ AK Student/Educator
- ☐ AL Other

3. What is the Primary End Product at this Location
(check only one)

- ☐ CA Communication Systems
- ☐ CB Components/Materials/ Hardware Supplies
- ☐ CC Computers/Systems and Sub-systems
- ☐ CD Consumer Products, Automotive & Appliances
- ☐ CE Contract Services-Design/ Manufacturing/Test/ IC Foundry etc.
- ☐ CF Controls
- ☐ CG Military/Government/ Avionics
- ☐ CH Medical Electronics
- ☐ CJ Semiconductors/ICs
- ☐ CK Test/Measurement/ Inspection
- ☐ CL Distributors
- ☐ CM Other

4. Product Interest - Which of the following do you specify, recommend, approve, purchase or influence the purchase of?
(check all that apply)

- ☐ BA ASICs, PLDs, FPGAs
- ☐ BB Board Level Products
- ☐ BC Semiconductors/ICs
- ☐ BD Components other than IC's
- ☐ BE Computers/Peripherals/ Software
- ☐ BF Contract Services - Design/Manufacturing/Test
- ☐ BG EDA Tools & Engineering Software
- ☐ BH Interconnection Devices
- ☐ BJ Laser & Electro-Optical Devices
- ☐ BK Microwave Components
- ☐ BL Packaging Hardware/ Enclosures
- ☐ BM Power Sources
- ☐ BN Production Equipment
- ☐ BP Production Tools & Supplies
- ☐ BQ Sensors & Transducers
- ☐ BR System Boards
- ☐ BS Test & Measurement Equipment
- ☐ BT Other

5. Years Involved in Industry

- ☐ DA 1 - 2
- ☐ DB 3 - 5
- ☐ DC 6 - 9
- ☐ DD 10 or more

6. Size of your organization

	At Your Location	In Entire Company
1 - 49	☐ EA	☐ EB
50 - 99	☐ EC	☐ ED
100 - 499	☐ EE	☐ EF
500 - 999	☐ EG	☐ EH
1,000 or more	☐ EI	☐ EJ

☐ GA **I would like to receive show and conference updates via e-mail**

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Send Conference Information on:
NANOWorld ☐
Wescon ☐
Both ☐

Dates
September 21-23, 2004
Anaheim Convention Center
Anaheim, California

Persons under 16 years of age not admitted. Students 16 or older admitted on Thursday September 23 only.

Also, please register my colleagues: Free Admission - Exhibits and free events.

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