

# IEEE ELECTRON DEVICES SOCIETY

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## 2004 IEEE INTERNATIONAL INTERCONNECT TECHNOLOGY CONFERENCE (IITC)



The seventh annual IEEE IITC (International Interconnect Technology Conference), the premier conference dedicated to advanced interconnect technology, will be held June 7-9, 2004 at the San Francisco Airport Hyatt Regency Hotel, conveniently located 20 minutes from Silicon Valley and downtown San Francisco.

The IITC was established with the support of the IEEE Electron Devices Society to provide an international forum to address interconnect issues from a system level viewpoint. The ever-increasing demand for more highly integrated circuit density and performance has led to a crisis in connectivity, and has shifted the design, cost, performance and reliability focus to interconnects. New materials, architectures, communication mechanisms and process technologies have arisen to meet this challenge, and no other semiconductor technology sector has been growing or changing more rapidly. The IITC provides a unique forum for professionals in the semiconductor industry and academia to present and discuss interconnect-related issues and new technologies for the fabrication of advanced interconnects in monolithic ICs, multi-chip modules (MCMs) and state-of-the-art packages.

This conference provides several venues for learning and professional interaction. The ever-popular short course, which addresses advanced interconnect process, design and reliability issues, will once again be offered on the day preceding the conference (June 6), and participation is strongly encouraged by those wishing to keep abreast of the latest interconnect technology advances. Without doubt, the cost and performance of ULSI circuits strongly depend on the capability and productivity of intercon-

### YOUR COMMENTS SOLICITED

Your comments are most welcome. Please write directly to the Editor-in-Chief of the Newsletter at [nstojadinovic@elfak.ni.ac.yu](mailto:nstojadinovic@elfak.ni.ac.yu)

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(Elected for a three-year term (maximum two terms) with 'full' voting privileges)

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### CONTRIBUTIONS WELCOME

Readers are encouraged to submit news items concerning the Society and its members. Please send your ideas/articles directly to either the Editor-in-Chief or appropriate Editor. The e-mail addresses of these individuals are listed on this page. Whenever possible, e-mail is the preferred form of submission.

### Newsletter Deadlines

Issue	Due Date
January	October 1st
April	January 1st
July	April 1st
October	July 1st

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## EDS TECHNICAL COMMITTEES CHAIR'S REPORT

The Electron Device Society has set-up technical committees to help make sure the Society is serving the right technical areas. The committees coordinate with meetings and publications to help insure that the technical information IEEE is rightly proud of remains on target and covers all the areas the members of the EDS are interested in.

There are 14 technical committees covering a wide spectrum of topics. They range from mainstream silicon technologies (VLSI Technology and Circuits) to more exotic materials (Organic Electronics) and emerging areas (Nanotechnology). Below is the complete list of the committees and their respective chairs.

We are currently refining the charter of a technical committee chair, so the role of the committees is better understood. The primary reason that committees exist is to make sure the EDS is responsive to new trends. The EDS, as an active technical society of the IEEE, needs to make sure that the technical offerings of the Society are in tune with emerging trends. The Society needs to be nimble enough to make sure it helps get meetings started or expanded to include new topical areas.

The technical committees perform several important functions for meetings management. We review and endorse all meetings that request any type of EDS support (both financial & non-financial). This is done to help



Nine of the 14 of EDS Technical Committee Chairs (left to right) Alan Seabaugh, John Meakin, Jim Dayton, Herb Bennett, Mark Law, Leda Lunardi, Andy Steckl, Chennupati Jagadish, and Rajendra Singh

make sure new meetings meet two goals. First, the meeting must cover an area of importance to the Society membership. Second, the meeting can't be in competition with another meeting – there are already over 140 EDS sponsored meetings. To help control the growth of meeting numbers, we also will be starting to review EDS sponsorship of meetings to see if EDS should sunset its involvement. As part of our meetings role, we also offer advice and suggestions to conferences. We can help a conference identify invited speakers, panelists, or short course lecturers.

The committees also work with publications. We attempt to coordinate with the Editors-in-Chief of the journals fully sponsored by EDS, i.e., –

*Transactions on Electron Devices and Electron Device Letters*. Also, several of the committees have been very active in helping some of the publications co-sponsored by EDS with other societies be successful. One of the things the technical committees have been active in is creation of special issues. For example, the Compound Semiconductor Device and Circuits Committee helped organize a special issue of the *Transactions on Semiconductor Manufacturing* (August 2003), entitled "Compound Semiconductor Microelectronics Manufacturing: The Future is Here." We also get involved with book proposals as appropriate.

The technical committee structure exists primarily to serve members' technical needs by making sure those needs are identified and addressed. We work with the conferences and meetings and journal editorship to make sure timely and relevant information is available to you to stay current in the field. If you see areas where the Electron Devices Society can better serve your needs for technical information, please share it with the appropriate technical committee chair.

*Mark E. Law*  
EDS Technical Committees Chair  
University of Florida  
Gainesville, FL, USA

### EDS Technical Committee Chairs

Compact Modeling	Narain Arora, Cadence
Device Reliability Physics	Lu Kasprzak, Reliability Consultant
Electronic Materials	Andy Steckl, University of Cineinatti
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Organic Electronics	Ananth Dodabalapur, University of Texas, Austin
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Power Devices and ICs	Toshiaki Yachi, Tokyo University of Science
VLSI Technology and Circuits	Bin Zhao, Skyworks Solutions
Technology Computer Aided Design	Mark Law, University of Florida

# UPCOMING TECHNICAL MEETINGS

## 2004 IEEE INTERNATIONAL VACUUM NANOELECTRONICS CONFERENCE (IVNC '04)

The IEEE International Vacuum Nanoelectronics Conference (IVNC 2004) formerly known as the International Vacuum Microelectronics Conference (IVMC), which rotates between America, Europe and Asia, returns to the USA in 2004. The 17th IEEE International Vacuum Nanoelectronics Conference (IVNC) will be held from Sunday, July 11 to Friday, July 16, 2004 at the Massachusetts Institute of Technology, Cambridge, MA, USA. The conference location is the Tang Center at MIT and Professor Tayo Akinwande will serve as the conference chairperson.

Since the first IVMC in Williamsburg, Virginia in 1988 under the pioneering sponsorship of IEEE, the conference has evolved into the leading international forum for reporting research in field emission mechanism, materials and devices, vacuum nanoelectronics, vacuum microelectronics, field ionization and field emission displays. A highlight of the conference will be the presentation of the Shoulders-Gray and Spindt (SGS) award for the best student paper at the conference banquet.

Vacuum nanoelectronics and field emission devices have evolved from laboratory curiosities to device technologies for a number of exciting and emerging applications ranging from field emission displays to electron beam lithography. Early work in field emission arrays focused on making arrays of gated microstructures based on metal or semiconductor field emission tips. These efforts focused on improving emission properties by forming nano-meter tip structures or lowering the workfunction of the emitting tips. Field emission arrays benefited from an exponential increase in feature density and the ability to fabricate nanometer structures using advanced lithographic and fine-feature deposition and etch tools. Recent advances in materials science specifically in carbon nan-



otube, semiconductor nanowires, micro-crystalline diamond, amorphous carbon, wide band semiconductors (GaN, AlN, AlGaIn, SiC etc) as well as metal carbides have resulted in a limitless set of possibilities for improving device performance and increase the potential applications for field emitters. The materials and fabrication technology advances have allowed large-scale arrays of field emitters with nano-scale features operating at low voltages.

Applications of field emission devices include high frequency power amplifiers, switching devices and radiation-hard electronics. Others are miniature x-ray sources, miniature free electron lasers and multi-electron beam lithography. The ability to fabricate large area field emission devices on a variety of substrates has led to the demonstration of 30" flat panel displays, very high resolution imagers (vidicons), jumbo displays, theater lights and backlights.

The goal of the conference is to bring together scientists and engineers with basic and applied research interests in electron and ion emission and devices based on these phenomena. The objective is to foster a cross breeding of ideas between basic and applied research in field emission and field ionization phenomena, and its technical applications in communications, multimedia, and nanotechnology and nanotechnology research. This conference will provide a forum for presentation and discussion of

recent developments in electron and ion emission mechanisms, new materials for electron and ion emission, vacuum nanoelectronic devices and technologies and field emission displays. Other topics of interest include thrusters based on ion or colloid emission and sensors.

Presentations are expected from both industrial and academic groups highlighting progress in a wide range of areas including field emission displays, surface science relevant to field emission, miniaturized X-ray sources, and field ionization. Past conferences have had a number of exciting announcements and display product demonstrations, including carbon nanotube-based and high resolution Spindt-tip based full color FED panels.

The program will include technical sessions comprised of both invited and contributed papers, which may be given in the form of oral as well as poster presentations. A number of international experts will give overviews on new developments and recent results. Workshops will be held on a number of specific subjects. Papers are solicited for oral and poster presentations at the IVNC '04 in all research topics related to field electron emission and field ionization phenomena and their applications to novel devices. The main topics are:

### **Theory, Modeling and Simulation**

Field electron emission, field ionization, charged droplet emission, new electron, ion and liquid-metal sources, trajectories of charged particles, including near the field emitter and beam optics, vacuum micro- and nano-electronic devices.

### **Materials and Technologies for Cold Cathodes**

Metal, silicon and wide bandgap semiconductor electron emitters, carbon materials, carbon nanotubes,

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## 2004 IEEE INTERNATIONAL INTERCONNECT TECHNOLOGY CONFERENCE (IITC)

(continued from page 1)

nect materials and processing equipment. In recognition of this critical role, supplier exhibits and seminars are included as an integral part of the IITC technical program and will be held on the first and second days of the conference. These exhibits and seminars offer additional learning and networking opportunities, and provide alternative forums to address specific technological challenges.

Oral presentations and poster papers offered during the conference span a broad range of interconnect technology topics, which include:

1. Dielectrics: Dielectric materials (low k, high k, ARCs, etc.) and deposition processes (vapor deposition, CVD, spin-on, etc.) for interconnect applications
2. CMP/Planarization: Dielectric/Metal CMP processes, equipment and metrology issues, and Alternate planarization techniques.
3. Metallization: Metal deposition processes/equipment (PVD, CVD, ALD, electroplating) and materials characterization, with particular emphasis on advanced aluminum and copper metallization.
4. Process Integration: Multilevel interconnect processes, clustered processes, novel interconnect structures, contact/via integration, metal barrier and materials interface issues, etc.
5. Process Control/Modeling: CMP, metal/dielectric deposition and etching processes, PVD, CVD, electroplating, etc.
6. Reliability: Metal electro migration and stress voiding, dielectric integrity and mechanical stability, thermal effects, passivation issues, interconnect reliability prediction/modeling.
7. Interconnect Systems: Interconnect performance modeling and high frequency characterization, interconnect system integration and advanced packaging concepts (flip-chip, chip-on-chip, MCM, etc.), novel architectures.
8. System-on-a-Chip: Interconnect, design and processing of SOC, embedded memory processing, materials and integration, RF and high frequency passive components, noise and cross-talk issues
9. Dry Processing: Dry etching of vias, trenches and damascene structures, dry etching of metal, dry cleaning processes, plasma induced damage, etc.
10. Alternative Interconnects: Advanced interconnect concepts, optical and RF interconnect, superconductors, nanotechnology-

based interconnect, etc.

Given the rapid acceleration of integrated circuit technology, the last topic provides an important forum for discussion of the interconnect crisis and potential paradigm shifts to novel interconnect schemes.

Professionals involved in interconnect-related activities are strongly encouraged to participate in this exciting new conference. Detailed information can be obtained from the IITC website: <http://www.ieee.org/conference/iitc>. For additional information or inquiries regarding supplier exhibits and seminars please contact Wendy Walker, IITC Administrator at +1 301-527-0900 Ext. 104, Fax: +1-301-527-0994, or email: [iitc@his.com](mailto:iitc@his.com).

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STMicroelectronics  
Crolles, France

## 2004 IEEE INTERNATIONAL VACUUM NANO-ELECTRONICS CONFERENCE

(continued from page 4)

nanowires, negative electron affinity surfaces, coatings and multi-layer thin-films, emitter structures (flat surfaces, high aspect ratio structures and NEA surfaces), reliability, lifetime, emission noise, interactions with residual gases, ion bombardment and current limitations.

### Design, Fabrication and Characterization of Vacuum Nanoelectronic Devices

Micro- and nano-fabricated emitters and integrated electrodes, MIMs, flat panel displays and display phosphors, field emission microwave amplifiers, sensors & actuators, analytical instruments and novel applications.

Student participation is encouraged for the conference. The Shoulders-

Gray-Spindt award will be presented honoring a student or recent graduate who presents the most innovative work at the conference.

IVNC-2004 venue is the campus of the Massachusetts Institute of Technology, located in Cambridge, Massachusetts. Cambridge is just across the Charles River from Boston and it offers an exciting multi-cultural setting where visitors from around the world mingle in the shadow of two of the world's premier educational institutions: Massachusetts Institute of Technology at Kendall Square and Harvard University at Harvard Square.

A city with a rich cultural heritage, Boston offers renowned museums, educational institutions and year-round performances in the arts. Near-

by are the waterfront, public garden, and many fine locales for dining and shopping, all easily accessible by public transportation.

Short abstracts are due on April 1, 2004. For more information on the conference and to view the call for papers please visit the website at <http://www-mtl.mit.edu/research/ivnc> or contact the organizing committee via email at [ivnc04@mit.edu](mailto:ivnc04@mit.edu). The local organizing committee consists of Professor Tayo Akinwande, Chair, Dr. Ioannis Kymissis and Dr. Ching-yin Hong.

*Tayo Akinwande,*  
IVNC General Chair  
Massachusetts Institute of Technology  
Cambridge, MA, USA

## 2004 IEEE SEMI-CONDUCTING & INSULATING MATERIALS CONFERENCE (SIMC)

The 13th IEEE Semi-conducting and Insulating Materials Conference (SIMC-XIII 2004) will be held 20-25 September 2004 in Beijing, China. The SIMC is a series of biennial conferences initiated in 1980 in Nottingham (UK). SIMC will continue its tradition of highlighting the fundamental materials problems of compound semiconductors, which are widely used for electronic and optoelectronic devices. Beijing is a city of contrasts. On one hand, it's fast becoming a modern city of first-class hotels, business centers, shopping malls and wide avenues.

On the other hand, there are the Hutongs, those ageless communities of narrow streets that have changed little over the past 700 years.

An important purpose of the meeting is to provide an opportunity for scientists and engineers from both the academic sphere and industry to meet together for an efficient scientific



exchange. The following seven topical areas comprise the scope of the Conference:

- Semi-insulating III-V compounds,
- Non-Stoichiometric III-V compounds
- Narrow band gap nitrides such as GaAsN and GaAsPN etc,

- Wide gap materials such as GaN, AlGaIn, AlGaN, SiC and ZnO etc,
- Nanomaterials and technologies
- Novel materials
- All kinds of devices emerging from the above materials.

The IEEE Electron Devices Society, the Chinese Academy of Sciences, and the National Natural Science Foundation of China, sponsor the conference. For additional conference program and registration information, please view our website at <http://simc.semi.ac.cn:6666/> or contact Conference Chairman, Prof. Zhanguo Wang, at: Tel: 0086-10-82304250; Fax: 0086-10-82305002; Email: [zgwang@red.semi.ac.cn](mailto:zgwang@red.semi.ac.cn).

*Zhanguo Wang, SIMC General Chair  
Key Laboratory of Semiconductor  
Materials Science  
Institute of Semiconductors, CAS, China*

## 2004 IEEE SYMPOSIUM ON VLSI TECHNOLOGY

The 24th Annual Symposium on VLSI Technology will be held in the beautiful city of Honolulu, Hawaii June 15-17, 2004. The Japan Society of Applied Physics (JSAP) and the IEEE Electron Devices Society (EDS) jointly sponsor the Symposium on VLSI Technology.

The conference will be held in the Hilton Hawaiian Village and begins with a one-day short course held on Monday, June 14, 2004. This is followed by three days of technical sessions held June 15-17, 2004. The technical sessions commence with a plenary session given by distinguished invited speakers, and then continue with presentations of submitted technical papers. Evening "Rump Sessions" on topics of current technical interest will also be held. A banquet will be held on the evening of Tuesday, June 15, 2004.

The Symposium welcomes the submission of papers on all aspects



of VLSI Technology. The scope of the Symposium includes:

- New concepts and breakthroughs in VLSI devices and processes
- New functional devices including quantum effect devices with possible VLSI implementation
- Materials innovation for MOSFET and interconnect in VLSI
- Advanced lithography and fine pat-

terning technologies for high density VLSI

- Process/Device modeling of VLSI devices
- Packaging and reliability of VLSI devices
- Theories and fundamentals related to the above devices
- New concepts and technologies for VLSI manufacturing

Two technical committees consisting of technical experts from industry and academia review submitted technical papers. These two committees are a North America and Europe (NAE) committee, and a Japan and the Far East (JFE) committee. Based on the combined ranking of these two committees, the best papers are selected and organized into technical sessions.

One of the strengths of the Symposium on VLSI Technology is its association with the Symposium on VLSI Circuits, which is held each year at the same location during the same

## 2004 IEEE SYMPOSIUM ON VLSI TECHNOLOGY *(continued from page 6)*

week. The 2004 Symposium on VLSI circuits will also be held at the Hilton Hawaiian Village June 17-19, 2004. A joint "Rump Session", on a topic of interest to both technologists and circuit designers, will be held on the evening of Wednesday, June 16, 2004.

The 2004 Symposium on VLSI Technology will be the 24th such meeting. The Symposium was initiated for the purpose of bringing together VLSI technologists from around the world in a forum where ideas and results can be exchanged and directions for future advances can be discussed and debated. The location of the Symposium typically alternates between the United States and Japan. The 2003 Symposium on VLSI Technology, held in Kyoto, Japan, was attended by more than 500 participants from around the

world, including attendance from the U.S., Japan, Europe, Taiwan, and Korea.

Honolulu, Hawaii is a beautiful city, which includes many beautiful physical and cultural attractions. Travel to the other surrounding Hawaiian Islands, each of which offers a unique setting and flavor, is also relatively easy. The Hilton Hawaiian Village, located on world-famous Waikiki Beach, is a world-class facility, which offers many recreational opportunities in addition to the intellectual stimulation of the conference. The Hotel is easily reached by taxi from nearby Honolulu International Airport.

For further information, please visit our web site at <http://www.vlssymposium.org>, or contact the following organizations:

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*Yuan Taur  
VLSI General Chair  
University of California  
San Diego, CA, USA*

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## MESSAGE FROM THE EDS NEWSLETTER EDITOR-IN-CHIEF

After six years of distinguished service, Dr. Wee Kiong Choi has departed from the Editorial Board this year. I am taking this opportunity to thank Wee Kiong for his dedicated service to the Newsletter as a Region 10 Editor. Replacing Dr. Choi is Dr. Xing Zhou from the Nanyang Technological University, Singapore, whose biography follows. Xing has a lot of experience in EDS related activities, and it is my pleasure to welcome him as the new Region 10 Newsletter Editor for Australia, New Zealand and South Asia.



*Xing Zhou*

Xing Zhou received the B.Sc. degree in electrical engineering from the Tsinghua University in 1983, and M.Sc. and Ph.D. degrees in

electrical engineering from the University of Rochester in 1987 and 1990, respectively. He is currently an Associate Professor at the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. His past research interests include Monte Carlo simulation of photocarrier transport and ultrafast phenomena as well as mixed-mode circuit simulation and CAD tool development. His recent research mainly focuses on nanoscale CMOS technology and device compact modeling. He was a Visiting Fellow at the Center for Integrated Systems, Stanford University during 1997 and 2001, and a Visiting Professor at Hiroshima University in January 2003. He has been the organizer for the Workshop on Compact Modeling (WCM) in collaboration with the International Conference on Modeling and

Simulation of Microsystems (MSM) in Puerto Rico (2002), San Francisco (2003), and Boston (2004). He has been a member of the Rel/CPMT/ED Singapore Chapter since 2003, and he was one of the organizers for the 3rd Workshop and IEEE EDS Minicolloquium on Nanometer CMOS Technology (WIMNACT-Singapore) in Oct. 2003. Dr. Zhou is a Senior Member of IEEE, a member of the EDS VLSI Technology & Circuits and Compact Modeling technical committees, a member of the EDS Regions/Chapters Committee, an EDS Distinguished Lecturer, and an elected Member of the IEEE EDS AdCom.

*Ninoslav D. Stojadinovic  
EDS Newsletter Editor-in-Chief  
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# SOCIETY NEWS

## DECEMBER 2003 ADCOM MEETING SUMMARY

President, Steve Hillenius, called the 2003 annual meeting of the IEEE Electron Devices Society to order on Sunday, December 7 at the Washington, D.C. Hilton preceding the 2003 IEDM.

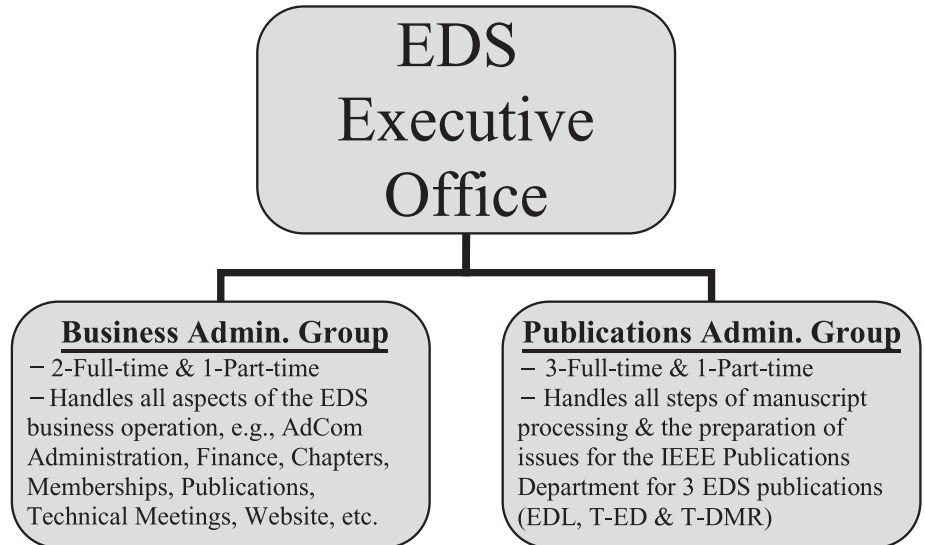
### Executive Reports

Recognized outgoing members of AdCom included: Arlene Santos, Ilesanmi Adesida, S.C. Sun, and Paul Yu (elected AdCom members); Herb Bennett (Compound Semiconductor TC Chair); Chennupati Jagadish (Optoelectronics TC Chair); John Meakin (Photovoltaic Devices TC Chair); Rajendra Singh (Semiconductor Manufacturing TC Chair); M. Ayman Shibib (Power Devices TC Chair); and James Hutchby (VLSI Technology TC Chair). Steve's opening remarks focused on the EDS strategic plan and its progress to date. To recap, the strategic plan calls for EDS to (1) broaden the base of technical areas of interest, (2) ensure that EDS activities reflect global trends, and (3) enhance its industry relationship. It was generally agreed by AdCom that the actions to date (which are summarized in the following reports) are in fact aligned with these goals, and that the realignment of the technical committees and new membership initiatives in China and India are carrying this plan forward. Also discussed were the locations of the Spring 2004 AdCom meeting (Madrid, May 23rd), and the Spring 2005 AdCom meeting (tentatively Seoul, Korea early June).

### EDS Strategic Initiative Position Statements

- Broaden the base of technical areas of interest
- Ensure EDS activities reflect the current and future global trends

Executive Director, Bill Van Der Vort, took a slightly different approach than usual in his report. In previous sessions, he listed the many adhoc projects that the Executive Office has been involved in over the course of the year. This year he discussed the "day-to-day" organization of the Executive Office, and its many functions. In



general, the Office consists of an Executive Director, five full-time staff, and two part-time staff split into two major groups, Business Administration, and Publications Administration, respectively, as shown in the graphic.

Bill discussed in detail the work performed by the Business Administration Group and advised that he would do the same for the Publications Administration Group at the next AdCom meeting. The Business Administration group handles general administration and finances (budgets, agreements, payment processing, purchase orders), the ExCom and AdCom activities (meeting support, presentation preparations, accommodations, meeting minutes, elections, recruitment), awards and recognitions (nomination & selection processes, development of new awards, brochures, preparation of certificates, Fellow nomination and selection, society endorsement for IEEE awards), and chapters

and education (development of new chapters, maintain Chapter Chairs List, Chapters Partners Program, travel reimbursements, chapter subsidies, the Distinguished Lecturer Program, Meetings, & Videotape Lending Library). Other activity includes membership (brochures, application



*EDS President, Hiroshi Iwai, presents Steve Hillenius with a gift and certificate in appreciation of his service as EDS President the past two years.*



forms, promotions, inquiries), the Newsletter (maintain schedule of articles to be published, editor support, meeting & chapter news), publications and CDs (production and distribution of CD ROM package, joint society publication agreements, new publication proposals), and technical meetings (maintain calendar, approve new EDS-sponsored meetings, review meeting budgets, issue loans, monitor status of meetings).

### Chair Reports

Treasurer, Paul Yu, reported that EDS finances took a positive turn in 2003 following the costly IEEE assessments of the previous two years, and that the reserves are increasing. He projected a \$42.9K net surplus for the year with a possible \$107K net in 2004 due to higher income from publications and conferences. [Note: all financial information within this report is in US\$.] Reserves rose to \$3,033K for 2003 and should remain stable for 2004. The brighter financial picture is also due to IEEE's change in policy to have the reserves of jointly sponsored publications, e.g., the *Journal of Microelectromechanical Systems*, and *Transactions on Semiconductor Manufacturing*, transferred to the sponsoring entities. Thus, Paul stated that EDS is in good fiscal shape compared to the last two years. His proposal to set the 2005 page count for EDL and T-ED at 925 & 2,600 pages, respectively, with a \$2 increase in the member price for these publications, was passed. It was also voted to keep the EDS membership fee at \$10 for 2005.

On the membership side, EDS had 12,371 members as of 10/31/03, slightly down from the 2002-year end figure of 13,368 (-7.4%). Of the 2003 count, 6,982 are regular members, 4,237 are permanent members, 1,129 are students, and 23 remain affiliate members. The demographics can be seen below.

Membership Chair, James Kuo, reports that EDS' -7.4% loss is among the lowest decrease of all the Division I societies. By comparison, CAS Society membership dropped by almost

IEEE Region	Count	% of Total
1-6 (United states)	7,122	57.6
7 (Canada)	225	1.8
8 (Europe, Middle East, & Africa)	2,260	18.3
9 (Latin America)	212	1.7
10 (Asia Pacific)	2,552	20.6
<b>Total</b>	<b>12,371</b>	<b>100</b>

32%. Senior membership in EDS increased in 2003 with 103 new SMs. The Membership Committee continues to promote interest through credit voucher programs at the IEDM, TIP mailings, and coordination of the Membership Fee Subsidy Program (MFSP), which subsidizes IEEE and EDS memberships for individuals who have an annual income that does not exceed \$11,100. In 2003, 15 chapters (125 members) have taken advantage of this program. Member-

new chapters in under-served regions, a modified version of the Membership Fee Subsidy Program (now called PMFSP) and the continuation of the Senior Membership Program (SMP) for membership retention. There are plans to participate in IEEE's Corporate Sponsored Membership Program. AdCom passed motions to (1) spend \$12K to support the PMFSP program for 2005, and (2) give \$5K to the SMP initiative for 2004.

New Regions/Chapters Chair, Cor Claeys, listed the five new EDS chapters formed in 2003. Namely AP/ED/MTT/CPMT Eastern North Carolina, ED/MTT Orange County, ED/CAS Univ. Catholique de Louvain (student branch), and ED Calcutta. This brings the current number of worldwide chapters to 109. Twenty-two other possible chapters are in the discussion stage for 2004.

*“Trends project a 50%-50% mix of US & non-US membership by approximately 2013 with a majority for the non-US members thereafter”*

*-James Kuo, Membership Chair*

ship is also playing a large role in the EDS Strategic Initiative. New membership promotion in China and India reflect the increase in semiconductor activity in these regions, particularly China, which has become a major semiconductor producer within the last few years. James showed that trends project a 50%-50% mix of US & non-US membership by approximately 2013 with a majority for the non-US members thereafter. In addition to this new recruiting program, the committee is continuing previous initiatives such as the promotion of

After reviewing the various sectional chapter activities, Cor announced that ED Boise is the EDS' "Chapter-of-the-Year" for 2003. The Distinguished Lecturer (DL) program continues worldwide. However, both the number of lecturers (107) and the number of lectures given (76) has dipped from their respective 2002 levels according to Ilesanmi Adesida, Education Chair. On the other hand, the number of "Mini Colloquia", where a group of DL's may visit a particular chapter or site, has risen. This year such meetings were held in Japan, Korea, Sin-

Award	Recipient/Affiliation
IEEE Undergraduate Teaching Award	Richard Jaeger (Auburn)
IEEE Frederick Phillips Award	Youssef Aly El-Mansy (Intel)
IEEE James Mulligan Award	Paul Gray (UC-Berkeley)
IEEE Andrew S. Grove Award	Krishna Saraswat (Stanford)
IEEE Daniel Noble Award	Larry J. Hornbeck (Texas Instruments)
IEEE Haraden Pratt Award	Jerry Yeagan (Univ. of Arkansas)
IEEE Cleo Brunetti Award	Stephen Chou (Princeton)
EDS J.J. Ebers	James Plummer (Stanford)
EDS Distinguished Service Award	Frederick "Rick" Dill (IBM)

EDS Recipients of National, and EDS Awards for 2003

gapore, Romania, Brazil and Mexico. Also in 2003, the EDS Videotape Lending Library was less active with fewer tapes borrowed. The EDS Graduate Student Fellowship Program had a very successful year. This year's winners were Yu-Long Jaing (Fudan University, Shanghai, PRC) and Javier Salcedo (Univ. of Central Florida). There were no nominees from Region 8 (Europe, Middle East, and Africa). On the Short Course side, the committee has produced a brochure listing the topics and lecturers. EDS has been participating in IEEE EAB's Xplore-Based Educational Products Initiative (started in July 2003) with funding from the IEEE Foundation to provide web-based short courses. A course on High-K Dielectrics by Jack Lee (U Texas-Austin) will be EDS' initial contribution to the program.

The address by Renuka Jindal, Publications Chair, discussed his group's efforts in establishing policies, procedures, & guidelines, performance metrics, publication costs, digitization, author recognition, IEEE Press relations, and all-electronic processing standards. As nanotechnology interest increases, EDS' Field-of-Interest statement defines its interest and position in this area. With this in mind, the definition of nanotechnology broadens and often EDS must decide if a particular activity pertains to EDS. This often comes down to the difference between nano-technology and nano-electronics. In Renuka's view "so long as the end result of such an activity is an electronic/ionic device it is in the domain of the Electron Devices Society". The Nanotechnology Council plans to work with EDS on establishing guidelines. With increasing electronic publishing, hardcopy circulation of both EDL & T-ED is decreasing. Renuka's group continues to examine additional metrics, or quality factors, based on editorial quality ratings, author surveys, and number of hits on IEEE Xplore to better rate publications. Both EDL & T-ED were profitable in 2003 with T-ED bringing in \$540K, and EDL about \$224K. As previously planned, the number of publications available via Xplore was reduced from 11 to 4, dropping the cost from \$121K to \$30K. In terms of electronic publishing, the status of IEEE publications is

mixed. While T-ED and EDL increasingly look more electronic in handling, and presentation (with electronic submission and prepublication access on Xplore) others have been less successful. T-CAD was discontinued and T-DMR is under a lot of stress. Thus the committee is sensitive to what authors and readers will be looking for as more journals go electronic and away from traditional hardcopy. In closing, Renuka announced the 2002 EDS best paper awards. The Paul Rappaport award goes to Yee Chia Yeo, Vivek Subramanian, Jakub Kedzierski, Peiqi Xuan, Tsu-Jae King, Jeffrey Bokor and Chenming Hu, and the inaugural George E. Smith award went to a group of researchers from IBM.

Jeff Welser, Technical Chair of the 2003 IEDM, expects 1500 attendees. The financials also look good with an expected surplus of \$98K to EDS. Meetings Chair, Ken Galloway got approval for all EDS repeat meetings in 2005. EDS is involved in 31 financially sponsored meetings, 109 technically co-sponsored meetings and no cooperation meetings. This is consistent with the decision made in 2002 to discontinue purely "cooperative" sponsorship. All conferences in the future must be either totally sponsored, or technically co-sponsored. Ken did express concern that for the period 2000-2003 EDS paid \$7990.00US in late fees for conferences that did not close their books on time. Some good financial news is the EDS surplus for meetings in 2003 should reach about \$400,000.00

Award's Chair, Al MacRae, presented a comprehensive list of EDS members recognized with major national, IEEE, and EDS awards in 2003, as summarized as follows:

Al reminded the assembled AdCom to continue being pro-active in nominating members for IEEE Awards in 2004. Steve Hillenius reported for the Fellows Chair, Yoshio Nishi, and he stated that from the 54 nominations received and evaluated by EDS, 19 were promoted to Fellow grade. There were also another 17 EDS Members elected who were evaluated by other societies. Cary Yang, who heads the Nominations and Elections Committee, discussed his proposal to change the position of EDS

Vice President to President-elect, which AdCom passed. Another motion was to require that at least one AdCom member is a GOLD member ("Graduate Of the Last Decade"). AdCom voted the motions favorably. Cary also initiated a motion to rename the chairs of all standing committees (Awards, Education, Meetings, Regions/Chapters, Membership, and Publications) to Vice President, which AdCom approved. AdCom also supported renaming the position of Technical Committees Chair (Mark Law) to Vice President of Technical Activities. Cary also gave a brief speech as outgoing Division I Director in which he lightly touched on the subjects of IEEE IT operations, cost control measures, and executive IEEE recruitment and hiring. Past EDS President, Lew Terman, is the incoming Division I Director in 2004. EDL Editor-in-Chief, Yuan Taur, reported that EDL further reduced its total paper turnaround time to an average of 3.7 months, surpassing his promised target as EIC. Paper acceptance increased from 42% to 45%. The 225 papers published in 2003 are higher than the 2002 number of 205.

## Technical Committee (TC) Reports

Herb Bennett's Compound Semiconductor TC reported their list of hot topics for 2004, which includes 40 Gb/s Optical Systems, long wavelength VCSELs (QDs or InGaAsN), optical interconnects (i.e. integration of CMOS with LEDs, VCSELs and photodetectors), organic light emitting devices/displays, and widebandgap (ZnO & GaN) optoelectronics. Other issues such as high-power UV (275nm to 290nm) light emitting diodes for communications and biosensor applications (e.g., AlGaIn and AlIn), carbon nanotube transistors, and spintronic devices (near 300K) are also on their "hot" list. This year Herb gave an overview of the Roadmap on Compound Semiconductors embedded in the 2003 ITRS. The addition of compound semi technology in the Wireless RF and Analog/Mixed-Signal IC Technology Roadmap in the "Process Integration, Devices and Structures" chapter of the 2003 International

Technology Roadmap (ITRS) for Semiconductors is a major step in getting recognition for this technology. In addition, the CSDCTC logo was registered in 2003 as an official trademark.

Rajendra Singh, past chair of the Semiconductor Manufacturing TC, praised the work of his group and the Transactions on Semiconductor Manufacturing staff in preparing the special issue, "Single Wafer Manufacturing in the Nanochip Era". Both groups are preparing a new issue in 2004, "Material Related Manufacturing Issues in Nanochip Era". Also sponsored was a workshop at the 2003 ISSM on "Cost and Performance Challenges at the 90 nm node and Beyond". At the 2004 ASMC there will be SMTC-driven panel discussion on growth, productivity and profitability related issues within the semiconductor industry. On the nanotechnology side, Alan Seabaugh's TC kept busy supporting the IEEE Nanotechnology Council, the Transactions on Nanotechnology, and the IEEE-Nano conference. Nanotechnology short courses at IEDM and the IEEE-Nano Conference were also among their 2003 activities. Finally, Jim Hutchby, VLSI Technology Chair, briefly discussed his group's adding four new members, activity within the ITRS Working Group on Emerging Research Devices, and transferring the administration of their website to IEEE as some of their accomplishments. In 2003, they teamed up with the "Comp 2002" International Conference on Modeling and Simulation of Microsystems Modeling for a "Compact Models" workshop, and another workshop on "Future Information Processing Technologies". Among their 2004 goals are proposed T-ED issues covering organic electronics, precise electrical measurement techniques for nanometer technologies, and Si/Dielectric Interfaces.

On the digitization scene, all EDL (1980-1987) and T-ED (1954-1987) issues have been scanned. The digitization of the IEDM proceedings from 1955-1987 has commenced. The 1963 IEDM Proceedings remain unfound as of this writing, and a search for it is in progress. This leaves EDS with an interesting choice: whether or not to offer the scanned publications as a

DVD and/or on the IEEE Xplore system, which offers web-based access. To convert all the pubs to DVD metadata would cost about \$113K versus \$12K for Xplore. In addition, the cost to produce the DVDs' (as recently estimated) would be \$65K for 5,000 (\$13 per set). However, DVD format is more advanced than Xplore in terms of search capability. Moreover, DVD offers additional possibilities such as a market segment for resale which could help recoup some of the money invested and provide a stand-alone better product than Xplore, improve service to members, and open the door to future DVD releases as a continuous source of income. AdCom was asked to choose whether or not to go the DVD route with a number of questions on the table. It was voted by AdCom to share the cost with IEDM in 2005 to convert all the pubs to DVD metadata, with EDS' cost not to exceed \$50K. The additional cost of producing the DVDs' will need to be addressed at the next AdCom meeting. AdCom also passed that the digitized EDS publications database be added to Xplore some time in 2004 and made available to all EDS members as part of their membership fee.

### Publication Reports

EDS IEEE Press Coordinator, Joe Brewer, reports that IEEE Press books are doing well in the marketplace. A special "Electron Devices" book series is being discussed where selected books would carry the EDS logo, and return some royalties to EDS. A formal approval of this plan is expected in early 2004. Newsletter Editor-in-Chief, Nino Stojadinovic, reviewed the highly favorable comments towards the Newsletter made in the IEEE All-Society Research Survey made in 2003. Respondees indicated that the Newsletter was very competitive in terms of reader satisfaction with the more research-heavy publications, EDL & T-ED, and non-research journals like *Circuits & Devices Magazine*.

Reporting on T-ED, Editor-in-Chief, Doug Verret, reported that the journal is accepting around 45-50% of its submissions with increasing interest from Japan, Taiwan, China, and Korea. In general, sources for papers are split

between 80% from academia, and 20% from industry. Doug explained that a two-month lag time in getting T-ED out to subscribers in late 2002 and early 2003 was due to attrition in the IEEE Publications Department. Speaking for T-DMR, Lu Kazprzak, standing in for Tony Oates, addressed some of the problems the publication is experiencing. Since 2001, this all-electronic journal has had a difficult time attracting authors and is just now starting to meet its budgeted page count. Over the past three years, the journal has experienced some significant financial losses, which are being equally shared with the Reliability Society. The trend can be explained by some inaccurate financial assumptions, lack of corporate sponsorship, and insufficient promotion. It is hoped that T-DMR will receive a share of the return from the IEEE All Society Periodicals Package in 2005, which may offset the money problems. AdCom considered whether or not to let T-DMR keep going, unbundle the journal, or cease publication altogether. A vote was delayed until 2004.

For 2003, the elected EDS officers are President, Hiroshi Iwai, Vice President, Ilesanmi Adesida, Treasurer Paul Yu, and Secretary, John Lowell. AdCom members who were elected for a second term are: Toshio Hiramoto (The University of Tokyo, Japan), Leda Lunardi (North Carolina State University, USA) and Philip Wong (IBM, USA). Newly elected AdCom members are: Steve Chung (National Chaio Tung University, Taiwan), Mark Lundstrom (Purdue University, USA), Albert H. Wang (Illinois Institute of Technology, USA) and Xing Zhou (Nanyang Technological University, Singapore).

The next meeting of EDS AdCom will be on Sunday May 23, 2004 in Madrid, Spain.



John K. Lowell

John Lowell  
EDS Secretary  
Consultant  
Dallas, TX, USA

## 2003 EDS J.J. EBERS AWARD



James D. Plummer

The 2003 J.J. Ebers Award, the prestigious Electron Devices Society award for outstanding technical contributions to electron devices, was presented to Professor James D.

Plummer of Stanford University. He was presented with the award at the International Electron Devices Meeting in Washington, D.C. on 8 December 2003. This award recognizes Professor Plummer "For contributions to new devices for power, memory and logic, and fundamental contributions to process modeling."

Jim Plummer was born in Toronto Canada. He received his B.S. degree from UCLA and his M.S. and Ph.D. degrees in EE from Stanford University in 1966, 1967 and 1971 respectively. From 1971 to 1978 he was a research staff member in the Integrated Circuits Lab at Stanford. He joined the Stanford faculty in 1978 as an Associate Professor and became Professor of Electrical Engineering in 1983. His career at Stanford has included serving as Director of the IC Laboratory, Senior Associate Dean in the School of Engineering, and Chair of the EE Department. He is currently the Frederick Emmons Terman Dean of the School of Engineering. He also holds the John Fluke Professorship in EE.

Much of Dr. Plummer's early work

focused on high voltage ICs and on high voltage device structures. He and his group made important contributions to integrating CMOS logic and high voltage lateral DMOS devices on the same chip and demonstrated circuits operating at several hundred volts. This work also led to several power MOS device concepts such as the IGBT which have become important power switching devices.

Throughout the 1980s and 90s, a major focus of his work was on silicon process modeling. This work involved many students and other faculty, particularly Professor Bob Dutton, and resulted in the development of several generations of SUPREM, which has become the standard process modeling tool used worldwide today. Dr. Plummer's contributions were principally in the areas of physical understanding and modeling of oxidation, diffusion, ion implantation and annealing. His recent work has focused on nanoscale silicon devices for logic and memory and has demonstrated new device concepts including vertical MOSFETs, the TRAM thyristor memory cell and the IMOS device which achieves  $<kT/q$  subthreshold slopes.

Dr. Plummer is a member of the National Academy of Engineering, and a Fellow of the IEEE. He has received many awards for his research, including the 1991 Solid State Science and Technology Award from the Electrochemical Society, the 2001 Semiconductor Industry

Association University Research Award and the IEEE Third Millennium Medal. He has graduated over 80 Ph.D. students with whom he has published more than 400 journal papers and conference presentations. These papers have won 8 best paper awards including 2 at IEDM and 3 at ISSCC. His recent textbook on VLSI technology is used by many universities around the world. He has also received three teaching awards at Stanford. He serves on the Board of Directors and on the technical advisory boards of several public and start-up companies and was one of the founders of T-RAM.

Dr. Plummer directed the Stanford Nanofabrication Facility from 1994 to 2000 and received an NSF commendation in 2000 for national leadership in building the NNUN, a consortium of 5 universities who opened their nanofabrication facilities as national resources for industry and for students from around the nation.

Jim and his wife Patti live in Portola Valley with their two daughters Katie and Julie who are 7 and 5. Jim enjoys running, swimming, skiing, golf and scuba diving. He's still able to outrun and outski both daughters, but they're gaining on him and it's pretty clear who the best athletes in the family will be in a few years.

Louis C. Parrillo  
EDS J.J. Ebers Award Chair  
Austin, TX, USA

## 2004 EDS J.J. EBERS AWARD CALL FOR NOMINATIONS

The IEEE Electron Devices Society invites the submission of nominations for the 2004 J.J. Ebers Award. This award is presented annually for outstanding technical contributions to electron devices. The recipient(s) is

awarded a certificate and a check for \$5,000, presented in December at the International Electron Devices Meeting (IEDM).

Nomination forms can be requested from the EDS Executive Office

(see contact information on page 2) or is available on the web at [www.ieee.org/organizations/society/eds/ebers.html](http://www.ieee.org/organizations/society/eds/ebers.html). The deadline for submission of nominations for the 2004 award is 1 July.

## 2003 EDS DISTINGUISHED SERVICE AWARD



Frederick H. Dill

The IEEE Electron Devices Society is extremely proud of the services that it provides to its members. Its members generate the premier new developments in the field of electron devices and share these results with their peers and the world at large by publishing their papers in EDS journals and presenting results in its meetings. This is a global activity that is effective because of the efforts of numerous volunteers. Many of these volunteers labor in relative obscurity, with their only reward being the satisfaction that they receive in being an important part of a successful organization, namely of the Electron Devices Society. They should be thanked.

The 2003 EDS Distinguished Service Award was presented to Frederick H. Dill at the International Electron Devices Meeting in Washington, D.C. on 8 December 2003.

Frederick Dill was born in Sewickley, PA, in 1932. He received a BS in Physics from Carnegie Institute of Technology in 1954 and MSEE and PhDEE degrees from the same school in 1956 and 1958. In his thesis work

he did some of the first numerical modeling of electron devices. He set up a small lab where he made the devices himself.

He joined IBM in 1958 and had a varied career, mostly in Research, but with seven years in semiconductor manufacturing. He fabricated the first tunnel diodes in IBM and also made their first GaAs lasers (invented coincident with Hall, et al. at GE). He is responsible for the concept of using cleaved surfaces for laser faces.

In the mid 1960's, he led a group building high speed integrated circuits with germanium as a high mobility semiconductor and achieved 150 picosecond circuit delays in 1967. He also terminated the program when it was clear that silicon was the correct path despite the lower electron speeds.

In the 1970's, he concentrated on metrology and lithography. He holds the fundamental patents on the computer-controlled spectrometer for measuring thin film thickness and also on rotating-analyzer and rotating-compensator ellipsometers.

Much of his external reputation is from his work in photolithography where he and his team created the first process models along with the underlying measurements needed to

support the models. The parameters used to describe photoresist exposure and development are now called the Dill Parameters.

In the 1980's, while managing display technology at IBM, he invented the video RAM (a DRAM with a secondary port for display refresh).

In the mid 1990's, Rick chose to reinvent his technical career and has focused his attention on process technologies for building recording heads for disk drives. With his electron device experience he has been able to significantly contribute to the shrinking of recording heads to the nanometer range. He was promoted to IBM Distinguished Engineer in 2002, IBM's highest engineering rank. With IBM's sale of the disk drive business to Hitachi, he moved to the new company in a similar role.

Rick has been married for 35 years to Amanda, a physician. They have three children, Kevin, Janet, and Stephen. Both sons work in computer software engineering. He lives in New York and California and enjoys hiking, skiing and historic house restoration.

*H. Craig Casey, Jr.  
EDS Distinguished Service  
Award Chair  
Durham, N.C., USA*

## EDS MEMBERS AWARDED 2002 NATIONAL MEDAL OF TECHNOLOGY

On November 6, 2003, President George W. Bush, in a White House ceremony, presented the National Medal of Technology to the team of Nick Holonyak, Jr., H. George Craford, Russell Dean Dupuis - inventors and innovators in the light-emitting diode (LED) technology field spanning forty years. This medal is the highest honor in technology in the United States. The National Medal of Technology was established by Congress in 1980 and recognizes men and women who embody the spirit of American innovation and have advanced the nation's global competitiveness. Their groundbreaking contributions com-

mercialize technologies, create jobs, improve productivity and stimulate the nation's growth and development.

This team, consisting of Professor Nicholas Holonyak, Jr., Microelectronics Lab, University of Illinois at Urbana-Champaign, Urbana-Champaign, IL and his former students M. George Craford, LumiLeds Lighting, San Jose, CA, and Russell Dean Dupuis, Georgia Institute of Technology at Atlanta, GA, has made pioneering contributions and been leaders in developing and commercializing the LED as a solid state light source. The citation for their award is; "For contributions to the

development and commercialization of light-emitting diode (LED) technology, with applications to digital displays, consumer electronics, automotive lighting, traffic signals and general illumination," the world's most efficient light source being mass-produced today.

Nick Holonyak Jr. made the first visible LED in 1962, ushering in a new era in electronics and digital display technology. Ten years later, M. George Craford made the extremely bright yellow LED, expanding the potential uses of LEDs dramatically. He subsequently led the R&D efforts at Hewlett-Packard/Agilent Technolo-

gies/LumiLeds Lighting, resulting in products that are now the highest-brightness available LEDs. In 1977, Russell Dupuis demonstrated that metalorganic chemical vapor deposition (MOCVD) could be used to grow high-quality semiconductor thin films and devices, including LEDs. Today, the MOCVD materials technology is a widely used method for the high-volume production of LEDs worldwide.

The proven and anticipated economic effects of LED technology are impressive. High-efficiency/high-brightness LEDs promise to revolu-

tionize lighting in general, in both exterior and interior applications. LED technology is widely used in the indicator, display and illumination markets, for instance clocks, watches, medical equipment, printers, flashlights and signs. LED technology is rapidly taking over the automotive lighting and traffic signal markets. LEDs are already beginning to penetrate the low-power white-light market in homes and in business. Their high efficiency and resultant widespread use will have an appreciable impact on worldwide energy require-

ments and thereby be an important contributor to the objective of reducing pollution.

The Electron Devices Society is proud of their accomplishments and congratulates this team of Nicholas Holonyak, Jr., M. George Craford and Russell Dean Dupuis for this highest level of recognition and for their important contributions to electron devices.

Alfred U. Mac Rae  
EDS Awards Chair  
Mac Rae Technologies  
Berkeley Heights, NJ, USA

## EDS MEMBERS NAMED WINNERS OF 2004 IEEE TECHNICAL FIELD AWARDS

Five EDS Members were among the winners of the 2004 IEEE Technical Field Awards. They are:



**Stephen Y. Chou** of Princeton University won the 2004 IEEE Cleo Brunetti Award. His citation states, "For the invention and development of tools for nanoscale patterning, especially nanoimprint lithography, and for the scaling of devices into new physical regimes."

Dr. Stephen Y. Chou's pioneering research on a broad variety of nanotechnologies and nanodevices has helped shape new paths in the fields of nanofabrication, nanoscale electronics, optoelectronics, magnetics and materials. In February 2003, the MIT Technology Review selected nanoimprint technologies and Chou's laser-assisted direct imprint (LADI) as one of the "10 emerging technologies that will change the world."

Dr. Chou's graduate work used X-ray lithography to scale MOSFETs to the 60 nm range, and since 1985 he has demonstrated very small MOSFETs and single electron transistors using various nanotechnologies. In 1995, he pioneered his best-known work (nanoimprint lithography (NIL) a revolutionary nanoscale patterning method that allows 10 nm patterning over large areas with high throughput and low cost. Numerous universities and industrial laboratories have since

established NIL research programs in response to Dr. Chou's work. The use and development of NIL in academia and industry has grown rapidly. Recently NIL was selected as one of the next generation lithographies for semiconductor IC manufacturing. Other achievements include his explorations of new phenomena and nanodevices, where conventional theory may no longer apply: such as lithographically induced self-assembly (LISA), sub wavelength optical elements and nanomagnetic devices.

Stephen Y. Chou was born in Beijing, China, on 30 October 1955. He studied physics at the University of Science and Technology of China and the State University of New York (SUNY) at Stony Brook, and in 1986 he earned a doctorate at the Massachusetts Institute of Technology (MIT), Cambridge, Massachusetts. After working at the Chinese Academy of Sciences' Institute of High Energy Physics in Beijing, SUNY Stony Brook, MIT and Stanford University in Palo Alto, California, Dr. Chou became a faculty member at the University of Minnesota in Twin-City in 1989 and eventually named the McKnight-Land Grant Chair Professor in the Department of Electrical Engineering. Since 1997, he has been the Joseph C. Elgin Professor of Electrical Engineering and head of the Nanostructure Laboratory at Princeton University, Princeton, New Jersey. He recently founded Nanonex Corp., and NanoOpto Corp., in Monmouth Junction and Somerset, New Jersey respectively.

An IEEE and Packard Fellow, Dr.

Chou is a reviewer for a number of IEEE publications. He has received the IEEE LEOS Best Student Paper Award, the University of Minnesota's George Taylor Distinguished Research Award, and the DARPA's ULTRA Program Significant Technical Achievement Award. Dr. Chou has published more than 280 papers and holds eight U.S. patents. His work has been cited over 3000 times by other scientific journal papers.



**Youssef Aly El-Mansy** of Intel Corporation won the 2004 IEEE Frederick Philips Award. His citation states, "For leadership in developing state-of-the-art logic technologies for

high performance/high volume general purpose microprocessors."

Dr. Youssef A. El-Mansy has led the way in balancing technological performance with manufacturability in the development of microprocessors. Thanks to his pioneering leadership, Intel has achieved preeminence in its field and the semiconductor technology cycle has been accelerated from three years to two.

Dr. El-Mansy joined Intel Corporation, Hillsboro, Oregon, as program manager of technology evaluation in 1979. He was appointed group vice president in 1993 and is currently corporate vice president and director of logic technology development. In the mid-1980s, Dr. El-Mansy led the develop-

ment of 1-micron logic technology. After being named director of Portland Technology Development (PTD), he guided Intel's logic technologies from 1-micron to the 0.065-micron generation. In doing so, Dr. El-Mansy implemented the "copy exactly" methodology, requiring all Intel manufacturing fabs to copy the PTD process tools and recipes exactly. This has placed extra burden on the development group, but has enabled unprecedented production rates at multiple sites and has been instrumental to Intel's preeminence in cost-effective support of high-volume product demand.

As a leader, Dr. El-Mansy personally contributed to critical technology choices and established the need to balance performance and manufacturability when selecting logic process features. He attracted and retained people with high technical skills and the willingness to take initiative, and under him the PTD group has become a leading R&D institution. Dr. El-Mansy is highly respected for his depth of VLSI knowledge and his early work in MOS devices and modeling. His current responsibilities include long-term research, leading edge microprocessor technology development and manufacturing, technology CAD and redesign of microprocessors for new technology generations.

Youssef A. El-Mansy was born on 8 March 1945 in Dessouk, Egypt. He earned a bachelor's and master's of science in electrical engineering from Alexandria University in Egypt in 1966 and 1970, respectively, and a doctorate in electronics from Carleton University, Ottawa, Ontario, Canada, in 1974.

An IEEE Fellow, Dr. El-Mansy has served on the IEEE Electron Devices Society (EDS) VLSI Symposia Executive Committee, was a member of the EDS AdCom, VLSI Technology Symposium Program Committee, and the International Electron Devices Meeting (IEDM) Program Committee. He has published over 30 papers.



**Larry J. Hornbeck** of Texas Instruments, Inc. won the IEEE Daniel E. Noble Award. His citation states, "For his pioneering work and sustained development of the Digital Micro mirror

Device, used in projection displays."

Dr. Larry J. Hornbeck, TI Fellow, led the development of the Digital Micro mirror Device (DMD), a microchip that revolutionized projection displays. The DMD remains the most complex micro-electro-mechanical systems (MEMS) device in existence today. Texas Instruments in Plano, Texas, where Dr. Hornbeck has worked since 1973, is recognized as a leader in the technology.

Thanks to its small size, high brightness and exceptional image fidelity, stability and reliability, many of the world's top display manufacturers market projectors and big-screen TVs based on the DMD microchip for conference rooms, home entertainment, large-venues, and digital cinema. After spending a decade working on new architectures for spatial light modulators at Texas Instruments, Dr. Hornbeck invented the DMD in 1987. Products capitalizing on the technology were shipped as early as 1996.

An array of fast, MEMS digital light switches monolithically integrated onto a silicon address chip, the DMD microchip enables stable images with no perceptible flicker. Dr. Hornbeck's leadership was pivotal to the project—from conceptualization to design of the silicon structures to development of the commercial manufacturing process, including allaying concerns about the complexity of the device and its extremely low tolerance of processing defects. Over the first decade of the DMD's existence, Dr. Hornbeck participated in numerous significant improvements targeted at performance, scalability, reliability and yield. As a technical leader, he constantly challenged his colleagues to continue the evolution of the technology and its capability.

Larry J. Hornbeck was born on 17 September 1943 in St. Louis, Missouri. He studied physics and solid-state physics at Case Western Reserve University in Cleveland, Ohio, earning his doctorate in 1974. He and his wife, Laura, reside on their thirty-two acre property in the country, near Van Alstyne, Texas north of Dallas. They have two sons, Jason and David.

Dr. Hornbeck is an IEEE Member and International Society for Optical Engineering (SPIE) Fellow. He has received Germany's Eduard Rhein Foundation Technology Award, England's Rank Prize, North Texas Inventor of the Year, an Emmy Engineering Award from the Academy of Television Arts & Sciences,

the Karl Ferdinand Braun Prize from the Society for Information Display (SID), the Electronic Imaging Honoree of the Year award from the SPIE, and the David Sarnoff Medal Award from the Society of Motion Picture and Television Engineers. Dr. Hornbeck has authored or co-authored 27 publications and holds 32 U.S. patents.



**Richard C. Jaeger** from Auburn University won the 2004 IEEE Undergraduate Teaching Award. His citation states, "For excellence in undergraduate teaching and development of

outstanding textbooks for courses in microelectronics."

A dedicated professor, Dr. Richard C. Jaeger is hailed by students for his ability to communicate complex concepts in a simplified manner, relating abstract thought to real-world applications.

Distinguished University Professor and Electronics Stem Chair at Auburn University in Alabama, Dr. Jaeger has been a driving force behind engineering curriculum development since 1979. He also has also served as acting director of wireless engineering since 2001, and is leading the implementation of the program's new bachelor of wireless engineering degree.

As founding director of Auburn's Alabama Microelectronics Science and Technology Center from 1984 to 2000, Dr. Jaeger championed the facility's development. The center allows undergraduates to participate in and practice every step of fabricating microelectronic chips, an opportunity most often reserved for graduate students.

Dr. Jaeger has published more than 200 technical papers and articles. The textbooks he has written, *Introduction to Microelectronic Fabrication* and *Microelectronic Circuit Design*, and co-written *Computerized Circuit Design Using SPICE Programs* (with Bogdan M. Wilamowski) are rapidly becoming standards throughout the world. His microelectronic texts have been translated into a number of different languages.

Born on 2 September 1944, Richard C. Jaeger received his bachelor's and master's degrees in electrical engineering in 1966, and his doctoral degree in 1969, all from the

University of Florida, Gainesville. He worked for the IBM Corporation in a number of capacities from 1969 to 1979, including as staff engineer and advisory engineer in Boca Raton, Florida, and a research staff member at the IBM T.J. Watson Research Center in Yorktown Heights, New York.

An IEEE Fellow, Dr. Jaeger is Vice President of the IEEE Solid-State Circuits Society. He previously has served on the IEEE Solid-State Circuits Council as president and member. Founding editor-in-chief of IEEE Micro, he is also past editor of the IEEE Journal of Solid State Circuits.

Dr. Jaeger holds three patents and has received two Invention Achievement Awards from the IBM Corporation. His numerous honors include the IEEE Computer Society's Outstanding Contribution Award and Golden Core Recognition, the IEEE Third Millennium Medal, the IEEE Education Society McGraw-Hill/Jacob Millman Award for outstanding textbook development, and Auburn University's Birdsong Merit Teaching Award. He also was selected as the 1993 Outstanding Electrical Engineering Faculty Member by the electrical and computer engineering students.



**Krishna C. Saraswat** of Stanford University won the 2004 IEEE Andrew S. Grove Award. His citation states, "For seminal contributions to silicon process technology."

Demonstrating visionary leadership for more than 30 years, Dr. Krishna Saraswat's influence

extends from fundamental research of silicon oxidation to system-level studies of wiring delays and chip performance. Consistently ahead of his time, he has made fundamental contributions on device structures, new materials and process technology of silicon devices and integrated circuits. These contributions have helped in continued scaling of device dimensions and improvement in the performance of integrated circuits. A Professor of Electrical Engineering and the Rickey/Nielsen Professor of Engineering at Stanford University in Stanford, California, Dr. Saraswat also serves as the Associate Director of the National Science Foundation / Semiconductor Research Corporation - Engineering Research Center for Environmentally Benign Semiconductor Manufacturing.

Dr. Saraswat's pioneering discoveries have repeatedly resulted in seminal advances for industry. One important example is his early 1980s work in WSi<sub>2</sub> polycide gate MOS technology, in which he broke with prevailing trends to successfully focus on chemical vapor deposition (CVD) technology. He later developed an Al/Ti metallization process which quickly became an industry standard. Dr. Saraswat has provided invaluable leadership on interconnect scaling and modeling/simulation, notably through his farsighted delineation of the RC delay in an article two decades ago. In the late 1980s, he focused on single wafer manufacturing, developing equipment and simulators for rapid thermal processing, deposition and etching. Since the mid-1990s, Dr. Saraswat has been working on scaling MOS technology

to nm range and on new concepts of 3-D integrated circuits with multiple layers of heterogeneous devices. He also is currently researching environmentally benign semiconductor manufacturing.

Born on 3 July 1947 in Pilani, India, Krishna Saraswat earned a bachelor of engineering degree in electronics from the Birla Institute of Technology and Science in Pilani, India, and a Master of Science degree in electrical engineering from Stanford University. After two years with Texas Instruments in Dallas, Texas, he returned to Stanford for his doctorate, completed in 1974, and to work as a research associate and subsequently as a professor in electrical engineering.

An IEEE Fellow and member of the Electrochemical and the Materials Research Societies, Dr. Saraswat has received the Electrochemical Society's Thomas D. Callinan Award and two gold medals for undergraduate excellence while attending the Birla Institute of Technology and Science. He is the author or co-author of more than 400 technical papers and is the recipient of several Best Paper Awards, including from the IEEE Electron Devices Meeting, the Annual Device Research Conference and from the Journal of the Electrochemical Society.

Dr. Saraswat resides in Saratoga, California, with his wife, Sonia and their two sons, Prashant and Vivek. His outside interests include traveling, hiking, photography, music and tennis.

*Al Mac Rae  
EDS Awards Chair  
Mac Rae Technologies  
Berkeley Heights, NJ, USA*

## 34 EDS MEMBERS ELECTED TO THE IEEE GRADE OF FELLOW

### Effective 1 January 2004

**Mark T. Bohr, Intel Corp, Hillsboro, OR, USA**

*for leadership in advancing CMOS logic technologies*

**Thomas J. Brazil, National University of Ireland, Dublin, Ireland**

*for contributions to circuit level modeling of non-linear devices*

**Kevin F. Brennan, Georgia Tech, Atlanta, GA, USA**

*for contributions to the modeling of impact ionization in heterostructures and multi-quantum well structures*

**Constantin Bulucea, National Semiconductor Corp., Santa Clara, CA, USA**

*for contributions to transistor engineering in the area of power electronics*

**Hsing-Yao Chen, Chunghwa Picture Tubes, LTD, Fox River Grove, IL, USA**

*for contributions to electron gun design for color cathode ray tubes*

**Denice Denton, University of Washington, Seattle, WA, USA**

*for leadership in engineering education and faculty mentoring*



**Robert R. Doering, Texas Instruments, Inc., Dallas, TX, USA**

*for leadership in the development of sub-micron CMOS and semiconductor manufacturing technology*

**Robert H. Eklund, Texas Instruments, Inc., Plano, TX, USA**

*for leadership in the development and manufacturing of sub-micron CMOS technologies*

**Hiromu Fujioka, Osaka University, Osaka, Japan**

*for contributions to electron beam testing of semiconductor devices and circuits*

**Stephen M. Goodnick, Arizona State University, Tempe, AZ, USA**

*for contributions to carrier transport fundamentals and semiconductor devices*

**Erik H.M. Heijne, CERN, Geneva, Switzerland**

*for contributions to semiconductor detector systems and radiation tolerant detector readout electronics*

**Jerry Hudgins, University of South Carolina, Columbia, SC, USA**

*for contributions to the design, modeling, and teaching of semiconductor devices for power electronics*

**Shuji Ikeda, Trecenti Technologies, Inc., Ibaraki, Japan**

*for contributions to the development and manufacturing of static random access memory*

**Hajime Ishikawa, Fujitsu Laboratories Ltd., Kanagawa, Japan**

*for technical leadership in the development of high-performance Si and GaAs devices and circuits*

**Robert W. Jackson, University of Massachusetts, Amherst, MA, USA**

*for contributions to the electromagnetic modeling of microwave integrated circuits and packaging*

**Kenneth M. Lakin, TFR Technologies, Inc., Bend, OR, USA**

*for contributions to thin-film resonator technology and applications*

**Colin C. McAndrew, Motorola,**

**Tempe, AZ, USA**

*for contributions to compact and statistical modeling of semiconductor devices*

**Meyya Meyyappan, NASA Ames Research Center, Moffett Field, CA, USA**

*for leadership in the development of nanoelectronic devices and processes*

**Alexander Nosich, Institute of Radio-Physics and Electronics of the National Academy of Sciences of Ukraine, Kharkov, Ukraine**

*for contributions to the applications of computational electromagnetics to antennas and open waveguides*

**Hiroshi Nozawa, Kyoto University, Kyoto Prefecture, Japan**

*for contributions to nonvolatile semiconductor memories*

**Mikael L. Ostling, KTH, Royal Institute of Technology, Kista, Sweden**

*for contributions to semiconductor device technology and education*

**Jerzy Ruzyllo, Pennsylvania State University, University Park, PA, USA**

*for contributions to ultrathin oxidation in microelectronic manufacturing*

**Victor Ryzhii, University of Aizu, Fukushima, Japan**

*for contributions to the development of quantum well infrared photodetectors and quantum dot infrared photodetectors*

**Nobuhiko Sawaki, Nagoya University, Nagoya, Japan**

*for contributions to the development of group III-nitride semiconductor materials and devices*

**Martin A. Schmidt, MIT, Reading, MA, USA**

*for contributions to design and fabrication of micromechanical systems*

**David B. Scott, Texas Instruments, Inc., Plano, TX, USA**

*for contributions to CMOS and BiCMOS technology and circuits*

**Ninoslav Stojadinovic, University of Nis, Nis, Serbia & Montenegro**

*for contributions to the reliability physics of metal-oxide-semiconductor devices*

**Roger W. Sudbury, MIT Lincoln Laboratory, Lexington, MA, USA**

*for leadership in gallium arsenide integrated circuits*

**Christer M. Svensson, Linköping University, Linköping, Sweden**

*for contributions to single phase clocking and high speed CMOS circuits*

**Stuart K. Tewksbury, Stevens Institute of Technology, Hoboken, NJ, USA**

*for contributions to telecommunications and interconnections in high performance digital systems*

**Douglas P. Verret, Texas Instruments, Inc., Stafford, TX, USA**

*for leadership in the commercialization of bipolar and BiCMOS technologies*

**Dwight L. Woolard, US Army Research Lab., Research Triangle Park, NC, USA**

*for leadership in the discovery and development of novel sensing methodologies and advanced electronic devices at terahertz frequencies*

**Shin-Tson Wu, University of Central Florida, Orlando, FL, USA**

*for contributions to liquid crystal displays and tunable photonic devices*

**Katsumi Yoshino, Osaka University, Osaka, Japan**

*for contributions to organic electronic and optoelectronic materials*

## **The Nominations of the Following IEEE Members Were Evaluated by EDS But the Individuals are Not Current Members of EDS**

**Gary B. Bronner, IBM, Hopewell Junction, NY, USA**

*for contributions to dynamic random access memory technology*

**Ghavam G. Shahidi, IBM Microelectronics, Hopewell Junction, NY, USA**

*for contributions to silicon-on-insulator technology products*

## RAJENDRA SINGH RECEIVES THE RTP CONFERENCE J. GIBBONS ACHIEVEMENT AWARD

Rajendra Singh of Clemson University received the RTP Conference J. Gibbons Achievement Award 2003 for his contribution to Rapid Thermal Processing. The award was presented to Prof. Singh at the 11th International Conference on Advanced Thermal Processing of Semiconductors – RTP2003 in Charleston, South Carolina last September.

R. Singh received the award “for pioneering contributions to Rapid Thermal Processing.” Prof. Singh is recognized as a promoter of Rapid Thermal Processing and especially single wafer processing since this technology entered the semiconductor manufacturing fabs. He is one of the first to recognize the important differ-



*Prof. Rajendra Singh, recipient of J. Gibbons Achievement Award 2003 with Co-chairs of 11th International Conference on Advanced Thermal Processing Semiconductors (From left to right: Zsolt Nenyey, Mattson Technology, R. Singh, Jeff Gelpy, Vortek Industries, B. Lojek Atmel Corporation.)*

ence in non-equilibrium thermal processing such as “photonic” effect. Prof. Singh wrote a review paper summarizing the aspects of rapid thermal processing which became a mandatory reading for all newcomers to the field.

Dr. Singh is currently D. Houser Banks Professor and Director Center for Silicon Nanoelectronics at Holcombe Department of Electrical and Computer Engineering Clemson University. He received a Ph.D. in physics from McMaster University, Hamilton, Ont., Canada, in 1979. He has published over 260 papers. He is a Fellow of IEEE, the Society of Optical Science and Engineering, the American Association of Advancement of Science and the material information Society ASM.

## CONGRATULATIONS TO THE EDS MEMBERS RECENTLY ELECTED TO IEEE SENIOR MEMBER GRADE!

Shahzad Akbar  
Mark G. Allen  
Mykhaylo I. Andriychuk\*  
Bob Atwell  
Mohamed H. Badawi  
Joan Bausells\*  
Oliver Brand  
Jeff D. Bude  
Iqbal M. Chaudhry  
Yves de Coulon  
Guido W. Dietz  
Mohamed A. Ditali  
William A. Doolittle  
Ian T. Ferguson

Roobik Gharabagi  
Elmer H. Guritz  
Garry J. Hausfeld  
William D. Hunt  
Benjamin Iniguez  
Mohammad Rezwan Khan  
C. Christopher Klepper  
Kelin J. Kuhn\*  
Youngwoo Kwon  
Pui To Lai  
Alvin LS Loke  
Burhanuddin Yeop Majilis  
Oleksandr Malik\*  
Dong-Sun Min

Kenneth O  
Sitthichai Pookaiyudom  
David C. Potts  
Shankarnarayana Ramaswamy\*  
Partha Ray  
William R. Richards, Jr.  
Hrayr A. Sayadian  
Gregory A. Simin  
Bruce E. Sohn\*  
John W. Spargo  
Goran Stemme  
Noriharu Suematsu  
Mamoru Terauchi  
Xijin Tian

Luan C. Tran  
Oliver Werther\*  
Walter Wohlmuth  
Guo-Liang Wu  
Meng-Chyi Wu  
Xiao Jie Yuan  
Olga F. Zamorska\*  
Truc Q. Vu  
Robert A. Weller  
Steven E. Wetterling  
Richard L. Woodin  
Ken H. Wong  
Viktor D. Yeryomka\*

\* = Individual designated EDS as nominating entity

If you have been in professional practice for 10 years, you may be eligible for Senior Membership, the highest grade of membership for which an individual can apply. New senior members receive a wood and bronze plaque and a credit certificate for up to US \$25 for a new IEEE society membership. In addition, a letter will be sent to employers, recognizing this new status.

For more information on senior member status, visit [http://www.ieee.org/membership/grades\\_cats.html#SENIORMEM](http://www.ieee.org/membership/grades_cats.html#SENIORMEM)  
To apply for senior member status, fill out an application at <http://www.ieee.org/organizations/rab/md/smelev.htm>.

# FINAL CALL FOR NOMINATIONS 2004 ELECTRON DEVICES SOCIETY GRADUATE STUDENT FELLOWSHIP

**Description:** One year fellowships awarded to promote, recognize, and support graduate level study and research within the Electron Devices Society's field of interest: The field of interest for EDS is all aspects of the physics, engineering, theory and phenomena of electron and ion devices such as elemental and compound semiconductor devices, organic and other emerging materials based devices, quantum effect devices, optical devices, displays and imaging devices, photovoltaics, solid-state sensors and actuators, solid-state power devices, high frequency devices, micromechanics, tubes and other vacuum devices.

The society is concerned with research, development, design, and manufacture related to the materials, processing, technology, and applications of such devices, and the scientific, technical and other activities that contribute to the advancement of this field.

At least one fellowship will be awarded to students in each of the following geographical regions every year: Americas, Europe/Middle East/Africa, Asia & Pacific.

**Prize:** US\$5,000 to the student, US\$1,000 grant to the student's department, US\$1,000 grant to the student's faculty advisor in support of the stu-

dent's project, travel subsidy of up to US\$3,000 to each recipient to attend the IEDM for presentation of award plaque. The EDS Newsletter will feature articles about the EDS Graduate Fellows and their work over the course of the next year.

**Eligibility:** Candidate must: be an IEEE EDS student member at the time of nomination; be pursuing a doctorate degree within the EDS field of interest on a full-time basis; and continue his/her studies at the current institution with the same faculty advisor for twelve months after receipt of award. Sponsor must be an IEEE EDS member. Previous award winners are ineligible.

**Basis for Judging:** Demonstration of his/her significant ability to perform independent research in the fields of electron devices and a proven history of academic excellence.

**Nomination Package:**

- Nominating letter by an EDS member
- Two-page (maximum) statement by the student describing his or her education and research interests and accomplishments
- One-page biographical sketch of the student
- One copy of the student's under-grad-

uate and graduate transcripts/grades. Please provide an explanation of the grading system if different from the A-F format

- Two letters of recommendation from individuals familiar with the student's research and educational credentials

**Timetable:**

- Nomination packages will be due at the EDS Executive Office no later than May 15, 2004
- Recipients will be notified by July 15, 2004
- Monetary awards will be given by August 15, 2004
- Formal presentation of the awards will take place at the IEDM Awards Ceremony in December 2004.
- Nominations packages can be submitted by mail, fax or e-mail, but a hard copy must be received at the EDS Office.

**Send completed package to:**

IEEE Operations Center  
EDS Executive Office  
445 Hoes Lane, Piscataway, NJ 08854  
USA

<http://www.ieee.org/eds/fellowship>

**For more information contact:**

Christopher Salicco, EDS Executive Office  
[c.salicco@ieee.org](mailto:c.salicco@ieee.org) or 732-562-6549

## 2003 EDS CHAPTER OF THE YEAR AWARD

The EDS Chapter of the Year Award is presented annually to recognize an EDS Chapter for the quality and quantity of the activities and programs implemented during the prior July-June period.

On December 8, 2003, at the IEDM held in Washington, D.C., the ED Boise Chapter received the 2003 EDS Chapter of the Year Award, which included a certificate and check for \$1,000. The award was received by officers of the Boise Chapter: Dr. Stephen Parke, Boise State University, University Liaison; Fernando Gonzalez, Micron Technology, Inc., 2003 Chapter Chair; Kunal Parekh, Micron Technology, Inc., 2003 Vice-Chair; and Dr. Salman



*EDS 2003 President, Steven J. Hillenius, presents the EDS Chapter of the Year Award to Kunal Parekh (2003 Vice Chair), and Stephen Parke (University Liaison) of the ED Boise Chapter.*

Akram, Micron Technology, Inc., 2004 Chapter Chair. The Boise Chapter, formed in 1998, sponsored the 1st Regional Workshop on Microelectronics and Electron Devices (uE-ED) in October 2002, and the University/Government/Industry Microelectronics (UGIM) Symposium in July 2003. Both conferences drew presenters and attendees from around the world. The next Regional Workshop on Microelectronics and Electron Devices (WMED) will take place in Boise, Idaho, on April 16, 2004.

*Cor L. Claeys  
EDS Regions/Chapters Chair  
IMEC  
Leuven, Belgium*

## EDS REGIONS 1-3 & 7 CHAPTERS MEETING SUMMARY

All the EDS chapters in IEEE regions 1, 2, 3 and 7 (East coast of U.S. and all of Canada i.e., North America East-NAE) were invited to the biennial Chapters meeting held on December 7, 2003 in conjunction with the IEDM at the Washington Hilton and Towers Hotel, Washington D.C. The main goal of the meeting was to establish a forum that facilitates for the chapters in NAE to share their experiences, issues and activities. Towards this end, a chapter from each of the 4 regions was invited to make a brief presentation.

M. Ayman Shibib, the Chair of the NAE Subcommittee for Regions/Chapters (SRC) SRC-NAE welcomed the attendees and introduced the agenda, which included an invited presentation from the ED Boise Chapter, the winner of the EDS 2003 Chapter of the Year Award. That was followed by a presentation from the CAS/ED North Jersey, ED Washington & Northern Virginia, ED/CPMT Orlando and ED/SSC Kitchener-Waterloo chapters. Then the Chair led an open forum where issues and concerns of the chapters were discussed. Following is a synopsis of the meeting.

Kunal Parekh, representing the ED Boise Chapter, presented the activities of the EDS 2003 Chapter of the Year winner. The main points of his presentation: 1. The executive committee of the chapter included 10 people covering important functions in the chapter, 2. The activities of 2003 included a national symposium, several IEDM tutorials (via use of the EDS Lending Library) and a membership drive, 3. The plans for 2004 included a workshop with short course, monthly invited talks from DL lecturers and local experts and some social functions, including a picnic and a banquet.

Durga Misra, representing the North Jersey Chapter (Region 1), highlighted their main activities. The North NJ Chapter in 2003 worked to cosponsor meetings with other societies of IEEE based on the membership's interest using the



*Participants at the EDS Regions 1-3 & 7 Chapters Meeting*

EDS DL program. They offered 7 lectures that were well attended.

Murty Polavarapu, representing the ED Washington/Northern Virginia Chapter of Region 2, gave an overview of the chapter, their membership, activities and some perspective on running successful chapter meetings. The membership of the Chapter is a mix of government, industry and academia. The Chapter sponsored a series of lectures on nanotechnology that was well received. Murty also presented a perspective on running a successful chapter meeting summarized in: 1. choose a topic of broad appeal, 2. find a suitable location for the meeting (e.g. a university), 3. publicize the meeting through IEEE channels, 4. establish a website that reference the presented lectures.

Anwar Sadat, representing the ED Orlando Chapter of Region 3, gave an overview of the chapter's activities for 2003. The chapter that included a variety of topics like CMOS-MEMS integration, ESD protection, CMOS RF ICs, sponsored several lectures. Future activities include lectures on the following topics: nanotechnology, optoelectronics, MEMS, CMOS device and IC reliability.

Arokia Nathan represented the ED/SSC Kitchener-Waterloo Chapter in Region 7 (Canada). He gave an overview of the chapter and its activities. The main activities of the chapter are around the University of Waterloo with good participation from student members. The chapter sponsored a

solar cell car competition, a series of 12 seminars on a variety of topics and a Fall Seminar Series on Giga-to-Nano Electronics. For 2004, the chapter is organizing a new seminar series on Flexible Electronics.

After the presentations, the Chair of SRC-NAE, Ayman Shibib, and the Vice-chair, Ted Sargent, led an open discussion and asked for input regarding chapter's perspective on membership participation, interaction with chapter partners, inter-

action with IEEE local sections and other issues.

All the chapters agreed that the EDS DL program is extremely helpful for the chapters and is and will remain a main source for their activities. Some chapters expressed some reservation about asking DL lecturers to give a talk because of the burden on the lecturer or financial considerations. Some noted that participation from industry is decreasing as the industry went through a difficult time the last few years and wondered about ways to improve that. Also observed was that the chapter chair was the only person in the chapter's executive committee and thus had to carry out many tasks in a limited time.

In responding to the chapters' issues, Ayman encouraged the chapters not to be bashful about requesting DL lecturers and pointed out that the SRC-NAE has supported partially the financial burden in some cases. As for the participation from industry, it was proposed that chapters should think of inducting members from industry for joining the executive committee and participation in their meetings by considering value-added activities from industry's perspective, for example providing relevant courses or workshops or helping in career development activities. For the interaction with partners, many chapters had minimal interactions with partners and it was clear something needed to be done to facilitate that. Ayman pointed out that he is

considering the appointment of several Vice Chairs whose main responsibilities will be to establish and monitor the interactions of the chapters with the partners. One Vice Chair will be appointed for each of the four regions.

To alleviate the burden of running all the chapters activities by one person, and to make sure of continuity of succession for chapter chairs, Ayman encouraged the chapters to extend their executive committees to many members

noting that the Boise Chapter, winner of the Chapter of the 2003 Year Award, had 10 members on its executive committee with well defined responsibilities.

To facilitate the interactions and communications of the chapters in the region, one of the Vice chairs will also be appointed to establish a virtual community for NAE and another Vice chair to promote educational activities within NAE. The new appointments will be announced shortly.

Overall, the meeting achieved its objectives and was helpful to the chapters and to the executive committee of SRC-NAE, which received good feedback from the chapters.

*M. Ayman Shibib  
EDS SRC-NAE Chair  
Agere Systems  
Allentown, PA, USA*

## EDS DISTINGUISHED LECTURER/CHAPTER PARTNER VISITS EAST UKRAINE

The visit to Kharkov and Alushta by Prof. Chennupati Jagadish, our EDS Chapter partner and EDS Distinguished Lecturer was held September 14-21, 2003. During his stay in Kharkov, Prof. Jagadish visited the Institute of Radio-Physics and Electronics of the National Academy of Sciences of Ukraine (IRE NASU). The IRE Director, Academician NASU Vladimir Yakovenko, briefly introduced Prof. Jagadish to the Institute structure and scope of research. Then Prof. Alexander Nosich, EDS East



*Professor Chennupati Jagadish visits Kharkov and Alushta in East Ukraine.*

Ukraine Joint Chapter Manager, guided Prof. Jagadish through the Institute and talked about its history (since 1955) and major accomplishments in the area of millimeter and sub-millimeter wave physics and technology. He also introduced Prof. Jagadish, as chapter partner, to the history and major activities of the Chapter.

The East Ukraine Joint Chapter was established in May 1995 by the initiative of 16 grassroots IEEE members, as the first in the ex-USSR IEEE chapter of the Antennas and Propagation Society. Next year it joined the ED, MTT and AES societies, and later the LEO, GRS, NPS and EMB societies. The full history of the Chapter, including original documents, annual reports, and announcements of forthcoming activities, can be found at its Website, [//www.rocket.kharkov.ua/euachapter](http://www.rocket.kharkov.ua/euachapter). Today this is the largest IEEE chapter

in the Ukraine, a nation of 50-million population and strong scientific community. It is not a surprise that it was established in Kharkov, the second largest Ukrainian city (1.6 million) and the hub of Ukrainian science and technology. Kharkov is located in the East-North of Ukraine and boasts its 199-years-old classical university, 23 other university-level education establishments, National Center for Nuclear Physics, 7 other R&D institutes of NASU, and, what is most remarkable, a perfectly cosmopolite reputation.

The East Ukraine Chapter holds two regular international forums with English as working language and a 300-strong attendance: the Kharkov Symposium on Physics and Engineering of Microwaves, Millimeter and Sub-Millimeter Waves (MSMW), and the International Conference on Mathematical Methods in Electromagnetic

Theory (MMET). Both will be taking place next time in 2004 and can be found through the Chapter Website. What is especially interesting, this Chapter is the only one in the Ukraine and probably the ex-USSR, which practices competitive annual elections of the chapter officers by the voting of all members, with an IEEE-style nomination, secret ballot, and tellers commission. The election information is available online and can be recommended to the other chapters in this part

of the world as an example to follow. Perhaps, the IEEE RAB/TAB should encourage this experience and disseminate it as wide as possible.

When visiting the IRE, Prof. Jagadish presented his distinguished lecturer's talk on "Quantum well and quantum dot intermixing for optoelectronic device integration". This was an exciting survey of the existing and prospective techniques for novel quantum electronic devices. Among them, there are multi-wavelength semiconductor lasers, WDM circuits, multi-color infrared detectors and other actively developed now ideas for the emerging photonic applications. The audience consisted of the IRE staff members, and also researchers and students from various Kharkov laboratories and universities. Prof. Jagadish replied to many

*continued on page 29*

# REGIONAL AND CHAPTER NEWS

## USA, CANADA AND LATIN AMERICA (REGIONS 1-6, 7 & 9)

### ED Washington/Northern Virginia

- by Michael Hurt

The Washington/Northern Virginia Chapter of the Electron Devices Society held its last two meetings of the Fall Nanotechnology Series on November 6 and December 4, 2003 at the Mitre Corporation campus in McLean, VA. At the November meeting, Dr. Anantha Krishnan of the Defense Sciences Office of DARPA gave a presentation entitled "Nanotechnology Applications - Biotechnology and Medicine." Dr. Krishnan reviewed aspects of the DARPA programs that address the integration of biological phenomena with MEMS and microfluidic technologies as well as novel hybrid interfaces to convert information from the biological world to electrical signals.

Ms. Deb Newberry, co-author of the recently published book, "Next Big Thing Is Really Small: How Nanotechnology Will Change the Future of Your Business", spoke on societal implications of nanotechnology at the December meeting. She shared many of the observations gleaned from the recently concluded National Science Foundation Workshop on the same subject.

### 2004 IEEE/SEMI Advanced Semiconductor Manufacturing Conference and Workshop

- by Tom Carbone

The IEEE/SEMI Advanced Semiconductor Manufacturing Conference (ASMC) and Workshop is an international conference sponsored by the IEEE Electron Devices Society (EDS), the IEEE Components, Packaging, and Manufacturing Technology Society (CPMT), and Semiconductor Equipment and Materials International (SEMI). ASMC 2004 will be held May 2 - 4, 2004 at the Seaport Hotel in Boston, Massachusetts. For general information and registration on ASMC 2004, visit <http://www.semi.org/asmc>, or contact Ms. Margaret M. Kindling, SEMI Washington, DC ([mkindling@semi.org](mailto:mkindling@semi.org))

### ED/CAS North Jersey

- by Dick Snyder

Professor Agis Illiadis of the University of Maryland and an EDS Distinguished Lecturer delivered a talk titled "High Power Microwave Effects on Electronic Devices and Circuits" at the ED/CAS North Jersey Chapter meeting on November 3, 2003. The meeting was held at the New Jersey Institute of Technology, Newark, NJ and 51 people attended. Professor Illiadis presented an overview of the research activities of his group at the University of Maryland in high frequency devices and also highlighted EDS activities in general.

### ED/CPMT Orlando

- by Anwar Sadat

The ED/CPMT Orlando chapter held a seminar on "Electrostatic Discharge (ESD) Protection Structures in Microchips" on September 10, 2003 at the University of Central Florida. In his talk Dr. J. J. Liou from the University of Central Florida presented an overview on the ESD and ESD protection techniques and discussed a MOS model suitable for circuit simulation under the ESD event. Finally, he addressed the design and optimization of ESD protection structures for RF applications.

The ED/CPMT Orlando chapter held a meeting on November 17, 2003 at the University of Central Florida. At the meeting EDS Distinguished Lecturer, Dr. Yuhua Cheng from Skyworks Solutions, Inc., presented a talk on "An Overview of Device Behavior and Modeling Issues in CMOS Technology for RF IC Design".

Finally, the ED/CPMT Society Orlando Chapter hosted a booth at the 11th IEEE International Symposium on Electron Devices for Microwave and Optoelectronic Applications (EDMO 2003) held November 17-18 in Orlando.

~ Murty S. Polavarapu, Editor

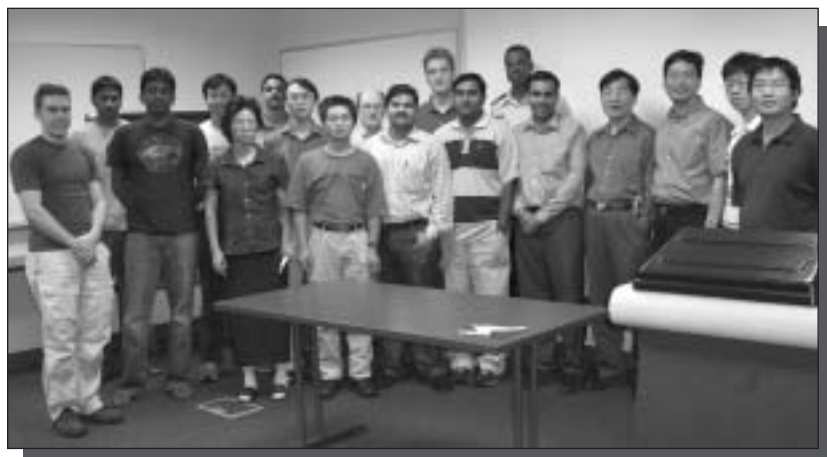
### ED Boise

- by Fernando Gonzalez

The 2004 EDS Boise Chapter Officers have a vision - a year of growth. The



Prof. Agis Illiadis at the ED/CAS North Jersey Chapter Meeting



Dr. Yuhua Cheng at the ED/CPMT Orlando Chapter



Juin Liou (left), EDMO 2003 General Chair, and Anwar Sadat (right), ED/CPMT Orlando Chapter Chair



WMED Tutorial

new officers, led by Dr. Salman Akram, are focused on involving new members in different chapter activities. The Vice-chairs, Dr. Jeff Jessing and Dr. Tom Jiang, will organize the Distinguished Speaker Series and the Short Course Tutorial Series, respectively. Our 2004 Secretary, Zhiping Yen, and Treasurer, Dr. Joseph Wang, will maintain our records in order.

Fernando Gonzalez will be the EDS Chapter Advisor and the General Chair for the 2004 WMED "Workshop on the Microelectronics and Electron Devices" on 16 April 2004, with the help of Kunal Parekh, Cynthia Bradbury, Dave Daniel, and Dr. Joseph Wang. The WMED is the centerpiece of our program. Dr. Steve Hillenius will be the keynote speaker, and Dr. Gary Bronner and Dr. Howard Rhodes will be invited speakers. The Call for Papers has gone out asking for contributing abstracts and papers that can be submitted by e-mail to fgonzalez@micron.com by Feb. 15th.

The Chapter of the Year Award has made our chapter more appreciative of the role that each EDS member has. Also, we realize that there are many other chapters equally worthy of such award. It is our challenge that we continue to better our chapter by bringing in new members with the help of William Kueber and training them to do a good job. Dr. Stephen Parke will lead the Chapter's University Liaison activities, and Gail Hawkins will lead the Chapter's Corporate Liaison activities.

National Engineers Week, February 16-22, will be an opportunity for

the EDS Boise Chapter to advertise to the other engineers. It will also be an opportunity to talk to high school and university students to encourage them to pursue engineering.

~ Sunit Tyagi, Editor

## EUROPE, MIDDLE EAST & AFRICA (REGION 8)

### MTT/ED/AP/CPMT/SSC West Ukraine

-by Mykhailo I. Andriychuk

The continuous cooperation between the IEEE Poland and Ukraine Sections as well as their chapters was embodied in the visit of Dr. Olga Zamorska, the West Ukraine Chapter Secretary/ Treasurer to the Telecommunications Research Institute (TRI) and Warsaw University of Technology (WUT), Warsaw, Poland October 13-17, 2003. We are very thankful to Prof. Marian Kazmierkowski, the IEEE Poland Section Chair, and Prof. Josef Modelski, the IEEE MTT-S Transnational Committee Co-Chairman for their efforts for the organization of this visit. During this visit, Dr. O. Zamorska presented the distinguished lecture "Optimization of plane antenna with semitransparent aperture" at the TRI and the Institute of Radioelectronics of WUT. In the lecture some questions of direct and inverse problems formulation for the various types of antennas with semitransparent boundaries were discussed. They

are: the fundamentals of cross-section method for solving the direct problems, the basic components of algorithm of optimization, the local variations method, the cross-sections method and the opposite directions method as well as various optimization criteria and results of numerical simulation.

The special meeting was devoted to the co-operation between the IEEE Poland and Ukraine Sections. In his speech, Prof. J. Modelski talked about the policy of the IEEE MTT-S Transnational Committee to serve the IEEE Region 8 Sections and their Chapters. The examples of such services regarding the IEEE Poland Section were presented in the talk of Prof. M. Kazmierkowski. Dr. Ye. Yashchyn, the West Ukraine Chapter representative at the IEEE MTT-S Region 8 Chapter's Chair Meeting, informed the attendees about the perspectives of evolution of the European microwave community discussed there.

The social program included the city tour around Warsaw and the possibility to become acquainted with its main sights: the Rynok Square, the



Dr. Olga Zamorska visits the MTT/ED/AP/CPMT/SSC West Ukraine Chapter.

Kings Castle, etc. The excursion tour in the wonderful ancient city Krakow was also organized.

## MTT/ED/CPMT/COM/SSC Novosibirsk

-by Viatcheslav P. Shuvalov

A summary of the technical, professional and business activity of the ED/MTT/CPMT/COM/SSC Joint Novosibirsk Chapter for the second half of the year 2003 is as follows:

The 4th International Conference 'Microwave Electronics: Measurements, Identification. Application MEMIA'2003' was held in Novosibirsk State Technical University from December 23 to 26, 2003. This conference attracted the interests of many specialists in the field of solid-state electronics, microwave electronics, communications, etc. The general attendance was about 70. Last year this conference was held in September, but we consider the tradition to hold such conferences in the winter as: new and very prospective. As a result of the conference, the volume of proceedings was issued. The IEEE ED/MTT/CPMT/COM/SSC Novosibirsk Joint chapter has provided the financial support for organizing the conference and printing the proceedings.

Our chapter presented material for the International Trade-Industrial Exhibition 'Sibsvyaz-2003' (Novosibirsk, World Trade Center 'Siberian Fair', September, 2003). Our chapter also made presentations at the great scientific-practical forum 'New Information Communication Technologies:



James Kuo with professors at Budapest University of Technology and Economics during the AP/ED/MTT/COM Hungary chapter partner visit on January 15

Achievements, Problems, and Perspectives', which were held in Siberian State University of Telecommunication and Informatics in September 2003. Our chapter provided technical and financial support for this forum as well.

Next year the IEEE Novosibirsk State Technical University Student Branch will celebrate its 5th Anniversary. Our chapter is planning to take part in the organizing and celebrating of this jubilee. We are planning to help in establishing the IEEE Education chapter, which will be established next year in Novosibirsk. We are also planning to participate in the 5th International Workshop and Tutorial on Electron Devices and Materials EDM'2004, which will be held at the Novosibirsk State Technical University Conference Center 'Erlagol' July 1-5, 2004. In general, we consider this year as being successful and fruitful.

~ Alexander V. Gridchin, Editor

## EDS Distinguished Lecturer/Chapter Partner Visits Hungary

-by James B. Kuo

I visited the AP/ED/MTT/COM Hungary Chapter, January 15-16. The Chapter Chair, Professor Tibor Berceli of Budapest University of Technology and Economics gave me a warm reception. During the visit, I gave a lecture entitled Low-Voltage SOI CMOS VLSI Devices and Circuits. I also met with about 15 professors, including Prof. Laszlo Zombora, who is the president of Hungarian Association for Info communications. I also visited their ED related research labs to see their

booming research activities. During the visit, we discussed the promoting of EDS membership and activities. In addition, to its excellent location and great cultures, Hungary is full of high-quality high-tech manpower owing to its very successful education system. After becoming a member of the European Union (EU) in May, the high-tech industry and research will be further enhanced.

## ED Poland

- by Andrzej Napieralski

After the 10th International Conference, "MIXED DESIGN OF INTEGRATED CIRCUITS AND SYSTEMS" - MIXDES'2003", which took place June 26-28, 2003 in Lodz Poland, awarded papers were published in the Polish Journal "Elektronizacja", which is sponsored by the ED Poland Chapter. Interesting papers from the conference presentations will be published in other editions of this journal. Some chosen awarded papers have also been submitted to the Microelectronics Reliability Journal.

On November 3, 2003, Lodz, Poland there was a joint meeting of the Microelectronics Section of Electronics and Telecommunication Committee of Polish Academy of Science and ED Poland Chapter. During the meeting, Dr. Jan Dziuban from the Wroclaw University of Technology presented achievements of the University in the area of chemical Microsystems. The idea of the joint meeting was well received by both groups, and this kind of common meeting will continue in the future.



MEMIA'2003 General Chair, Prof. Victor Gridchin, is opening the conference



On November 6, 2003 the Institute of Electron Technology in Warsaw, Poland organized a scientific meeting of the IEEE ED Poland Chapter, where Prof. Sorin Cristoloveanu (an EDS Distinguished Lecturer) from the Centre de Projets en Microélectronique Avancée presented a talk entitled "Advanced SOI Structures: Characterization and Mechanisms".

The ED Poland Chapter co-organized the 11th International Conference MIXDES 2004, which will be held on 26 June 2004 in Szczecin, Poland. During the conference two special sessions are planned:

- "High Speed Networking" organized by Dr. Kris Iniewski, SilicomOS, Canada
- "Advanced Compact Modeling and its Standardization" organized by Dr. Wladyslaw Grabinski, MOTOROLA Geneva, Switzerland

For the open of the plenary session the following presentations are planned:

- "Diamond Technology for MEMS and Electronics" (Prof. Erhard Kohn, University of Ulm, Germany)
- "Electronic Product Life-Cycle Design-For-Test: Status and Future Challenges" (Dr. Ben Bennetts, Bennetts Associates, United Kingdom)
- "Compact Modeling of Silicon Carbide Power Devices" (Prof. H. Alan Mantooth and Ty R. McNutt, University of Arkansas, USA)
- "Development of Integrated Microsensors for Chemical And Biochemical Applications" (Prof. Salvatore Baglio, University of Catania, Italy)
- "Mixed Mode Device and Circuit Simulation" (Stephan Wagner and Prof. Siegfried Selberherr, Technische Universität Wien, Austria)

During the conference, the ED Poland Chapter and Microelectronics Section of Electronics and Telecommunication Committee of the Polish Academy of Science will take place.

Starting from this edition of the conference the "Information Technology" topic will be included. More information about the conference can be found at <http://www.mixdes.org>.

The next joint meeting of the ED Poland Chapter and Microelectronics Section of Electronics and Telecommunication Committee of the Polish Academy of Science is planned during

the 8th National ELTE 2004 Conference, which will take place in Stare Jablonki, Poland on 19-22 April 2004.

~ **Andrzej Napieralski, Editor**



Participants at the EDS Mini-Colloquium in Bucharest, Romania.

### Report on EDS Mini-colloquium on Semiconductor Nanotechnology, Bucharest-Romania, 17-18 November 2003

-by Marcel D. Profirescu

Professor Rajendra Singh of Clemson University, USA, the ED Romania Chapter Partner, was scheduled to visit and give a distinguished lecturer this past November. In order to have a more consistent technical meeting and a wider audience, Dr. Wim Schoemaker of MAGWEL, (formerly with IMEC), was subsequently invited and therefore a mini-colloquium was held 17-18 November.

On 17 November, after a welcoming address by Marcel D. Profirescu, the EDS SRC- EAM Vice Chair, Professor R. Singh presented the first lecture entitled: Nanotechnology: Hype and Reality followed by the EDS 50th Anniversary tape: 50 Years in 50 Minutes. There were almost 200 attendees and the talks were followed by questions and comments.

On 18 November, Dr. Wim Schoemaker gave a talk entitled: HF Interconnects and Passives Modeling followed by Rajendra Singh's lecture: Semiconductor Manufacturing: Challenges and Opportunity for Profitability and Sustained Growth. There were about 150 participants and many questions and comments. Over the two-day period, the participants included academics, students and experts from research institutions and industry.

The guests had a full program with technical and social visits and meetings, including the local Chapter and Student Branch Chapter members.

Overall the mini-colloquium was successful, and the audience had the chance to listen to more than one DL in one place.

### MTT/ED/AP/LEO UK&RI

-by Terry Oxley

IEEE International Symposium on Electron Devices for Microwave & Optoelectronic Applications (EDMO) - In its 11th year, EDMO-2003 was held for the first time in the USA, at the Radisson Barcelo Hotel, Orlando, Central Florida on 17 and 18 November 2003. The University of Central Florida and the UK&RI MTT/ED/AP/LEO Chapter

sponsored the event, with technical co-sponsorship from IEEE EDS and in cooperation with IEEE MTT-S & LEOS, IEE UK and IOP UK.

The Symposium was hosted by Professor Juin J Liou (Chairman), from the Department of Electrical and Computer Engineering, University of Central Florida, Orlando, Florida. Professor Liou opened the meeting with a welcoming address stressing the high quality of the submitted papers and encouraged the participants to actively contribute to session discussions. Special thanks were also given to Prof Ali A. Reza-zadeh who inaugurated the first EDMO symposium at King's College London in 1993.

The technical sessions lasted two days addressing important issues of the electron devices for microwave and optoelectronic applications research. Papers were presented from eighteen different countries and were arranged in eight oral and one poster sessions - 41 oral presentations and 11 poster papers - covering all aspects of modern SiGe, GaAs, InP, GaN, SiC devices ranging from modelling over circuit simulation and design to system aspects. Emphasis was placed on material growth and characterizations, wide-band gap microwave devices, Si and SiGe devices and circuits, device and circuit modelling and technology and on microwave and photonic devices as well as circuits.

Prestigious Invited Speakers included papers on the topics of: "Novel wide band gap devices using strain energy band engineering" by Michael Shur, Rensselaer Polytechnic Institute, USA; "Progress and challenges of GaN-based microwave HEMTs amplifiers and novel spin devices" by Steve Pearton, University of Florida, USA; "L-band, high-efficiency 25 Watt power amplifier for base station systems" by Yeong-Her Wang, National Cheng Kung University, Taiwan; "Impact of semiconductor technology scaling on CMOS radio" by Kwiro Lee, KAIST, Korea; "Recent advances in GaN HEMT development" by Frank Schwierz, Technical University Ilmenau, Germany; "High power and high linearity electro absorption analog RF link" by Paul Yu, UC San Diego, USA; "Review on ESD protection for RF and microwave IC's" by Albert Wang, Illinois Institute of Technology, USA; "Analysis of gate misalignment effect on the threshold voltage of DG/FD SOI NMOS devices" by James Kuo, National Taiwan University, Taiwan; "Multi-gate 3-D SOI MOS-FETs as the mainstream technology in high speed CMO applications" by Adeldo Ortiz-Conde, Simon Bolivar University, Venezuela; "CMOS RF devices and circuit reliability" by Peter Yuan, University of Central Florida, USA; "An overview of device behaviour and modelling of CMOS technology for RF IC design" by Yuhua Cheng, Skyworks Solutions, Inc., USA; "Silicon integrated photonics: potentials and promises" by Hei Wong, City University of Hong Kong, Hong Kong; and "Use of MeV ion implantation for isolation of GaAs and InP-based HBTs" by Ali A Reza-zadeh, University of Manchester Institute of Science and Technology (UMIST), Manchester, UK.

In addition to the technical sessions, the Symposium dinner was held on Monday at a nearby restaurant, providing a unique atmosphere for the delegates to discuss their experience and networking. In summary, the meeting was considered to be highly successful; it attracted more than 70 delegates. The Symposium Proceedings, containing more than 300 pages, is available through the IEEE on-line Catalog (IEEE Catalog No. 03TH8691, ISBN 0-7803-7904-7, Library of Congress 2003103734).

The next EDMO, EDMO-2004, in its 12th consecutive year, will take place at Gruger National Park, South Africa from November 8-9, 2004, South Africa. For further information, please contact the EDMO 2004 Chairman Professor Lukas W Snyman, E-Mail: isnyman@techpta.ac.za, or visit: [www.edmo-symposium.org](http://www.edmo-symposium.org).

IEEE High Frequency Postgraduate Student Colloquium (HFPS) – HFPS-SC-2004, the 9th in the series, will be held at UMIST in Manchester UK on Monday 6th and Tuesday 7th September 2004. Contributions are sought from postgraduate students who are working in fields relating to electromagnetism, RF, microwave, mm-wave and optical technologies. For further details, please contact the 9th HFPS Chairman Dr Rob Sloan, E-Mail: [sloan@umist.ac.uk](mailto:sloan@umist.ac.uk), or the website [www.ee.umist.ac.uk/mw/](http://www.ee.umist.ac.uk/mw/).

CHAPTER CHAIRMAN: For further information on Chapter news please contact the Chapter Chairman: Ali A Reza-zadeh, Professor of Microwave Engineering, Dept. of Electrical Engineering and Electronics, University of Manchester Institute of Science and Technology (UMIST), P.O. Box 88, Manchester M60 1QD, UK. Tel: +44 (0) 161 200 4708 (Sec.4801). E-Mail: [a.reza-zadeh@umist.ac.uk](mailto:a.reza-zadeh@umist.ac.uk).

~ **Gady Golan, Editor**

## ED Benelux

-by *Hans Wallinga*

The ED Benelux Chapter had a number of technical meetings in 2003.

April 25, Seminar by Prof. Muchio Tajima, Institute of Space and Astronomical Science, Sagami-hara, Japan, "Characterization of SOI Wafers by Photoluminescence Spectroscopy, Decay and Micro/Macro-Mapping". Venue: the IMEC auditorium, IMEC, Leuven.

May 20, 2003: Seminar by Dr. ir. J.H. Klootwijk, Philips Research, Eindhoven, "InP based HBT technology for next generation microwave applications". Venue: University of Twente Building EL/TN, Enschede.

November 25-26: SAFE workshop 2003 in Veldhoven (jointly with STW)

For 2004 the following events have been held/are scheduled at this moment:

16 January 2004, 14.00 hr, Seminar

by Dr. L.K.J. Vandamme,

Eindhoven University of Technology, "1/f Noise in MOSTs: Faster is Noisier"

Venue: University of Twente, Building: Hoge-kamp (formerly EL/TN) room nr. B 1220

11 and 12 October, GAAS 2004, Amsterdam (sponsored by IEEE, EDS)

24, 25 and 26 November 2004 (preliminary; jointly with STW) Workshop SAFE/Prorisc, Veldhoven.

Members, planning to organize technical meetings in 2004 that might fit to the interest of the ED Benelux Chapter are invited to contact the chapter chair: Prof. Hans Wallinga; [h.wallinga@ieee.org](mailto:h.wallinga@ieee.org)

University of Twente, PO Box 217, 7500AE Enschede, the Netherlands.

~ **Christian Zardini, Editor**

## ASIA & PACIFIC (REGION 10)

### ED/MTT India

-by *Dr. K.S. Chari*

A national seminar on "System on Chip (SOC)" was organized at Shanmugha Arts, Science, Technology and Research Academy at Tamil Nadu during 27-29 November, 2003. The event featured presentations covering: Evolution, Trends and Opportunities in SOC; Design flow for IP Integration; Moving India up in the Semiconductor value chain; Smart Sensors in SOC; Design for test considerations in SOC; Inside into the SOC design flow, modeling and simulating software defined radios; Embedded systems for SOC; Challenges to SOC designers in wireless communication applications; Impact on nanometer related timing failures on at-speed testing; Emerging trends in 4G Wireless technologies; and Embedded Systems Design. Over 80 participants attended the event from industry, academia and research communities. The event received major financial support from the Ministry of Communications and Information Technology.

A National conference on the "Legal Issues in IT Industry – Techno-Legal 2003" was organized by the Manufacturers Association of Information Technology (MAIT) Ban-



Delegates at the SOC seminar held at SASTRA, Tanjavur

galore in association with the Chapter during 10-11 December. The event brought together representatives from semiconductor industry, legal councils and attorneys and researchers at one forum to discuss issues related to techno-legal aspects of the IT sector. Several lead talks delivered included: Legal issues for IT product companies; Opportunities for Indian Technologies companies through alternative investment; Issues for IT/ BPO companies; Doing business internationally, Data protection; Integrated circuits design law; Managing outsourcing contracts; and M&A in the technology industry. The event brought together over 100 participants and was also supported by the Ministry of Communications and Information Technology.

The Chapter Chair visited the PSNA College of Engineering and Technology, REC Trichi and SASTRA and MS Ramaiah School of Advanced Studies in Bangalore. The Chapter Chair delivered talks on Advances in Microelectronics: R&D and teaching approaches; Issues in Systems on Chip; Intellectual Property Cores; Project Implementations at UG/PG in IT; and VLSI Design Methodologies. A promotion of IEEE /EDS membership was also launched at these venues. The Chapter had an executive meeting at REC Trichi on 29 December.

For more information, please contact Dr. K.S. Chari, Director, Microelectronics & Photonics Division, Department of Electronics, C.G.O. Complex, New Delhi, India, Tel: 91-11-4361464; Fax: 91-11-4363082; email: chari@mit.gov.in.

### API/ED Bombay

-by Prof. M.B. Patil

On 3 October, Ms. Saroj Pathak, Submicron Circuits, Inc (USA) gave a talk on "Future market and technology trends for non volatile technology and design."

The All India EDS Chapters' Meeting was held on 4 October at IIT Bombay. Dr. Renuka Jindal, Dr. M.K. Radhakrishnan (Chapter partners for some of the chapters in India) and office bearers from the Bangalore, Bombay, Calcutta and Delhi chapters attended the meeting. A variety of issues related to EDS activities were discussed.

A Mini-Colloquium was held on 4 October in which the following talks were presented: (a) "RF MEMS Design" by Navakanta Bhat, Indian Institute of Science, (b) "Micro structural damages induced by gate dielectric stressing in sub-micron devices" by Dr. M.K. Radhakrishnan, Singapore, and (c) "From multi bits to tera bits" by Dr. Renuka Jindal, University of Louisiana at Lafayette.

Dr. Lajos Gazsi, Infineon Technologies, Munich, talked on "System complexity in the semiconductors industry and its consequences" on 28 November. Dr. Lucky Vishnubhotla, Motorola Philips-ST Microelectronics Alliance, Crolles, France talked on "Ultra thin plasma nitrated gate dielectric for 65nm CMOS platform" on 16 December. On 23 December, Dr Karl Baringer presented a seminar on "MEMS micro-optical and micro-robotic actuators".

For more information, please contact Prof. MB Patil, Electrical Engineering Department, IIT Bombay, Powai, Mumbai 400076, India, Email: mbpatil@ee.iitb.ac.in.

### REL/CPMT/ED Singapore

-by Dr. SH Ong

The Singapore Chapter successfully organized the 3rd Workshop and IEEE EDS Mini-colloquia on Nanometer CMOS Technology (WIMNACT-Singapore) on 15 October 2003 in Singapore. For details, please refer to the EDS Newsletter, Jan. 2004, Vol. 11, No. 1 reported by Xing Zhou and Kin Leong Pey.

Mr. Chih-Hang Tung of the Institute of Microelectronics (Singapore) presented a technical talk on ULSI Semiconductor Technology – A Microscopic Tour through TEM. Both graduate students and industry engineers showed deep interests in the topic.

The Chapter also organized the 5th Electronics Packaging Technology Conference (EPTC 2003), 10-12 December 2003, Singapore. The conference had 150 selected technical papers presented in 28 sessions with 4 parallel tracks. The conference was well attended.

The Chapter Committee member Dr Xing Zhou has been appointed as an Editor of the IEEE EDS Newsletter for 2004.

Charles Lee is elected as CPMT BOG for 2004.

For more information, please contact Dr. SH Ong, Email: Soon.Huat.Ong@nsc.com.

~ Wee Kiong Choi, Editor

### ED/SSC Seoul

- by Taegeun Park

In 2003, the IEEE Seoul Chapter hosted three talks by distinguished lecturers. Prof. Steve Kang, University of California, Santa Cruz presented an interesting paper entitled, "Three High-Tech Tenors for the 21st Century," at Korea

University, Aug. 27, 2003. In this talk, important aspects of information technology, nanotechnology, and biotechnology were discussed with emphasis on their synergistic engineering applications. A chapter meeting followed the distinguished lecture at the dinner table to give the chapter members a chance to get together with the distinguished lecturers and to have close conversations on selected topics. Prof. Vojin G. Oklobdzija, University of California, Irvine, presented another talk entitled, "Microprocessor Development Perspective," at the Korea University, Sep. 17, 2003. He addressed advances in enabling technology and a perspective for the future development. The features, which enabled development of modern microprocessors and the guiding principles of modern microprocessor architecture, were discussed. Prof. Vojin G. Oklobdzija presented another talk entitled, "High-Speed VLSI Arithmetic UNIT: VLSI circuits for arithmetic operations, "critical path" optimization, implementation and algorithm," at Yonsei University, Oct. 31, 2003. A chapter meeting was held with chapter members after his presentation. As a part of annual support of the conferences, the Seoul Chapter sponsored the SOC Design Conference held at Coex, Asem Hall, Seoul, Korea, Nov. 5-6, 2003. The Seoul Chapter sponsored (\$300) for the "Best Student Paper Award" to recognize outstanding student authors, who published high quality papers in IEEE EDS and SSCS journals. Two student authors (one from EDS and SSCS) have been selected for the prize with \$200 cash. The award was presented at the SOC Design conference. The IEEE Seoul Chapter has held a chapter meeting on a bimonthly basis and also makes an effort to promote membership by opening the membership development desk on local meetings.

## ED Kansai

- by *Hiroyuki Sakai*

On December 17 2003, an educational meeting was held at Osaka University, Osaka, Japan. This was the first attempt to provide video lectures for the Kansai Chapter members by taking advantage of the EDS Videotape Lending Library. Five lectures from the short course of the 2002 IEDM



"Best Student Paper Award" in SOC design conference on Nov.5-6, 2003.

entitled "RF Device Technologies for Communication Systems" were screened. The meeting went over very well with the participants, 13 in total including 7 students. After this success, we have decided to hold a 2nd one on January 14 2004 and continue to provide this kind of meetings through the year.

~ *Hisayo S. Momose, Editor*



The educational meeting for Kansai Chapter members



Participants of the 2003 IEEE Conference on Electron Devices and Solid State Circuits (EDSSC'03)

## Report on the 2003 IEEE Conference on Electron Devices and Solid State Circuits (EDSSC'03)

-by *Hei Wong*

On December 16-18, 2003, the ED/SSC Hong Kong Chapter held the international conference: IEEE Conference on Electron Devices and Solid State Circuits (EDSSC 2003), at the New World Renaissance Hotel. The goals of this conference were to bring together scientists, engineers, and students to discuss the latest achievements in electron devices and solid-state circuits and to facilitate interactions among local researchers as well as their international counterparts. This event was technically co-sponsored by the IEEE Electron Devices and Solid State Circuits (ED/SSC) Hong Kong Chapter, IEEE Electron Devices Society, IEEE Solid-State Circuits Society, IEEE Hong Kong Section and financially supported by the K.C. Wong Foundation, the Hong Kong University of Science and Technology, Fong's Family Foundation and Mr. Lim Por Yen.

EDSSC'03 continues a series started in 1994 when the IEEE Electron Devices Chapter was first established. The first 9 meetings were held under the name Hong Kong Electron Devices Meeting (HKEDM). The new name, introduced in 2003, reflects a broadening of the Conference scope and the enhancement of the collaboration with the solid-state circuits expertise and as a consequence of the establishment of the ED/SSC Hong Kong Chapter.

EDSSC'03 featured fifteen invited talks on timely and important topics

like nanoelectronics, advanced memory technology, power devices and circuits, RF devices, and communication circuits. The invited distinguished speakers did not only present interesting talks on topics of current importance, but also stimulated the discussion of the critical issues of microelectronics from basic science to the practical subjects. Even under the shadow of the SARS disease, the response of the EDSSC'03 was still overwhelming. We had a significant number of international submissions from 22 countries or regions. After being carefully referred, a total of 110 high-quality contributing papers, covering broad areas and important topics in the field of advanced microelectronic processes, devices and circuits, were finally accepted for presentation in the three-day program.

This year's event was also specially organized for celebrating the 10th Anniversary of the ED Hong Kong Chapter. During the past decade, many colleagues in Hong Kong and

friends from overseas have made significant contributions to the development of the ED Hong Kong Chapter and our local and international activities. On this special occasion, the Chapter presented the 10th Anniversary Award to Professor J. J. Liou (University of Central Florida, U.S.A.), Dr. P. T. Lai (University of Hong Kong) and Dr. M. C. Poon (Hong Kong University of Science and Technology) for their "Outstanding Contribution to the Development of ED/SSC Hong Kong Chapter".

In addition to the technical program, we had arranged several non-technical events. On Tuesday evening we hosted a traditional Chinese banquet and held the 10th Anniversary awards ceremony. On Wednesday evening, we arranged a boat trip around the Harbor and on the boat the best paper awards were presented. The Best Paper on Devices was given to M. -C. Cheng, L. Jun and M. Shen of Clarkson University, USA (Paper title: Dynamic Thermal Circuit of SOI MOSFETs for Fast

Digital Operation). C. -H. Shih, Y. -M. Chen and C. Lien of National Tsing Hua University, Taiwan with their paper entitled "Design Strategy of Localized Heavy Doped Halo Profile for Achieving Sub-50 nm Bulk MOS-FET" were awarded with the Best Student Paper on Devices. S. Chen, O. Trescases and W. T. Ng of University of Toronto, Canada and Texas Instruments, USA with their paper entitled "Fast Dead-Time Locked Loops for a High-Efficiency Microprocessor-Load ZVS-QSW DC/DC Converter" received the Best Paper on Circuits. The Best Student Paper on Circuits was "1.25-Gb/s 0.25- $\mu$  m CMOS Clock Recovery Based on Phase- and Frequency- Locked Loop" by Y. Hu and Z. -G. Wang of Southeast University, China. On Thursday afternoon, a local tour was arranged to explore the different sides of the City. Those functions had offered excellent opportunities to renew friendships and make new acquaintances for the participants.

~ Hei Wong, Editor

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## RELIABILITY – YEAR-IN-REVIEW SEMINAR

The IEEE Electron Devices Society and IEEE Reliability Society sponsor the Reliability-Year-In Review seminar. The purpose of the seminar is to provide a clear concise summary of some of the top papers on hot topics from the previous year along with experts to discuss and answer your questions on each topic.

The 2004 seminar will be held 29 April at the Hyatt Regency Phoenix at Civic Plaza, Phoenix, Arizona and the review topics are: Failure Analysis; Transistor Stability; Product Reliability (User Perspective); Nanotechnology & Dielectrics. Registration for the seminar is \$100.00 and to register go to <http://www.irps.org/04-42nd/reg.html>.

The 2003 seminar covered: Cu-Low k Interconnect Reliability, High-k Reliability, Non-Volatile Memory Reliability and ESD. If you missed the 2003 seminar, you can order a DVD for \$75.00. Visit the IRPS site at: [http://www.irps.org/past-pub\\_sales.pdf](http://www.irps.org/past-pub_sales.pdf) for an order form and fax it to 315-336-9134, or call 877-772-7101, or email: [pub\\_services@irps.org](mailto:pub_services@irps.org).

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## EDS DISTINGUISHED LECTURER/CHAPTER PARTNER VISITS EAST UKRAINE

*continued from page 21*

questions of the audience, about both his own research and research done in the Australian National University in Canberra.

In 2001, due to a significant increase in LEOS membership, an independent chapter was established in Kharkov. Both Kharkov chapters were the primary organizers of the International Conference on Advanced Optoelectronics

and Lasers (CAOL-03) in Alushta, small city on the Black Sea coast of the Crimea, on September 16-21. The conference attracted some 150 participants from the Ukraine, Russia, Europe, North America, Australia and Japan. Thanks to the use of English as the working language and the nice Mediterranean-type environment, Prof. Jagadish took part in CAOL-03 and pre-

sented an invited paper there. He was then seen to the airport in Simferopol, the main city of the Crimea, and flew to his further destinations as an EDS Distinguished Lecturer.

Anatoly Kirilenko  
ED/AP/MTT/AES/GRS/NPS/EMB  
East Ukraine Joint Chapter IRE  
NASU  
Kharkov, Ukraine

# EDS MEETINGS CALENDAR

## (AS OF 20 FEBRUARY 2004)

THE COMPLETE EDS CALENDAR CAN BE FOUND AT OUR WEB SITE:

[HTTP://WWW.IEEE.ORG/ORGANIZATIONS/SOCIETY/EDS/MEETINGS\\_CALENDAR.HTML](http://www.ieee.org/organizations/society/eds/meetings_calendar.html) PLEASE VISIT!

April 14 - 15, 2004, T **Siberian Conference on Electron Devices and Materials**, Location: TUSCR, Contact: Oleg Stoukatch, Tomsk State Univ. of Control Systems & Radioelec, Tomsk, Russia, E-Mail: ird@tusur.ru, Deadline: 12/10/03, www: <http://www.me.tusur.ru/~iteee>

April 15 - 16, 2004, T **Wireless and Microwave Technology Conference**, Location: Marriott Suite Hotel, Clearwater, FL, USA, Contact: Lawrence Dunleavy, University of South Florida, E-Mail: dunleavy@eng.usf.edu, Deadline: 1/15/04, www: <http://www.wami2004.org>

April 20 - 20, 2004, T **Workshop on Photonics & Its Applications**, Location: Cairo University, Giza, Egypt, Contact: Said El-Khamy, Alexandria University, E-Mail: elkhamy@ieee.org, Deadline: Not Available, www: Not Available

April 25 - 29, 2004, \* **IEEE International Reliability Physics Symposium**, Location: Hyatt Regency Phoenix at Civic Plaza, Phoenix, AZ, USA, Contact: Bernie Pietrucha, Rowan University, E-Mail: pietrucha@rowan.edu, Deadline: 10/24/03, www: <http://www.irps.org>

April 25 - 29, 2004, T **Science & Technology of Semiconductor-on-Insulator Structures & Devices in a Harsh Environment**, Location: Sanatorium "Pushcha Ozerna", Kyiv, Ukraine, Contact: Yuri Houk, Institute of Semiconductor Physics, NAS of Ukraine, E-Mail: houk@lab15.kiev.ua, Deadline: 1/15/04, www: <http://www.dice.ucl.ac.be/NATO-ARW-SOI/NATO-ARW-SOI-fulldetails.pdf>

April 26 - 27, 2004, T **IEEE/Sarnoff Symposium on Advances in Wired and Wireless Communications**, Location: Nassau Inn, Princeton, NJ, USA, Contact: Henry Owen, Sarnoff Corporation, E-Mail: howen@sarnoff.com, Deadline: 10/30/03, www: <http://www.sarnoffsymposium.org>

April 27 - 29, 2004, @ **IEEE International Vacuum Electronics Conference**, Location: Double Tree Hotel, Monterey, CA, USA, Contact: Ralph Nadell, Palisades Convention Management, E-Mail: rnadell@pcm411.com, Deadline: 1/5/04, www: <http://www.ivec2004.org>

May 4 - 6, 2004, \* **IEEE/SEMI Advanced Semiconductor Manufacturing Conference**

**and Workshop**, Location: The Seaport Hotel, Boston, MA, USA, Contact: Margaret Kindling, SEMI, E-Mail: mkindling@semi.org, Deadline: 9/18/03, www: <http://www.semi.org/asmc>

May 16 - 19, 2004, \* **International Conference on Microelectronics**, Location: University of Nis, Nis, Yugoslavia, Contact: Ninoslav Stojadinovic, University of Nis, E-Mail: nstojadinovic@elfak.ni.ac.yu, Deadline: 9/30/03, www: <http://unitop.elfak.ni.ac.yu/miel>

May 17 - 21, 2004, T **International Conference on Microwaves, Radar and Wireless Communication**, Location: Gromada Conference Center, Warszawa, Poland, Contact: Elzbieta Sedek, Telecom Research Institute, E-Mail: godlewska@pit.edu.pl, Deadline: Not Available, www: <http://www.pit.edu.pl/MIKON-2004>

May 18 - 20, 2004, T **International High Temperature Electronics Conference**, Location: Hilton of Sante Fe, Santa Fe, NM, USA, Contact: R Johnson, Auburn University, E-Mail: johnson@eng.auburn.edu, Deadline: 12/5/03, www: <http://www.imaps.org/callfor/HiTEC2004.htm>

May 23 - 26, 2004, T **International Power Modulator Symposium**, Location: Renaissance Parc 55 Hotel, San Francisco, CA, USA, Contact: Hulya Kirkici, Auburn University, E-Mail: hulya@kirkici@ieee.org, Deadline: 2/10/04, www: <http://www.eng.auburn.edu/pmc2004/>

May 24 - 27, 2004, @ **IEEE International Symposium on Power Semiconductor Devices & Integrated Circuits**, Location: Kitakyushu International Conference Center, Kitakyushu, Fukuoka, Japan, Contact: Tatsuo Sakai, NTT Musashino R&D Center, E-Mail: sakai.tatsuo@lab.ntt.co.jp, Deadline: 12/20/03, www: Not Available

June 1 - 4, 2004, T **International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication**, Location: San Diego Marriott Hotel & Marina, San Diego, CA, USA, Contact: W Meisbruger, E-Mail: d.meisburger@att.net, Deadline: 1/7/04, www: <http://www.EIPBN.org>

June 1 - 4, 2004, T **International Workshop on Expert Evaluation & Control of Compound Semiconductor Materials & Tech-**

**nologies**, Location: ENSAM, Montpellier, France, Contact: S Contreras, E-Mail: exmatec04@ges.univ-montp2.fr, Deadline: Not Available, www: <http://exmatec04.ges.univ-montp2.fr/welcome.php>

June 6 - 8, 2004, T **IEEE Radio Frequency Integrated Circuits Symposium**, Location: Fort Worth Convention Center, Fort Worth, TX, USA, Contact: Stephen Lloyd, Skyworks Solutions Inc, E-Mail: llloyd@ieee.org, Deadline: 1/15/04, www: <http://www.rfic2004.org>

June 7 - 11, 2004, T **European Photovoltaic Solar Energy Conference and Exhibition**, Location: Le Palais des Congres, Paris, France www: <http://www.photovoltaic-conference.com/index.html>

June 7 - 9, 2004, \* **IEEE International Interconnect Technology Conference**, Location: Hyatt Regency at the San Francisco Airport, Burlingame, CA, USA, Contact: Wendy Walker, Widerkehr & Associates, E-Mail: wendyw@widerkehr.com, Deadline: 1/9/04, www: <http://www.his.com/~iitc>

June 13 - 14, 2004, @ **IEEE Silicon Nanoelectronics Workshop**, Location: Hilton Hawaiian Village, Honolulu, HI, USA, Contact: Wolfgang Porod, University of Notre Dame, E-Mail: porod@nd.edu, Deadline: 2/15/04, www: <http://www.nd.edu/~ndnano/si-nano/>

June 15 - 17, 2004, @ **IEEE Symposium on VLSI Technology**, Location: Hilton Hawaiian Village, Honolulu, HI, USA, Contact: Phyllis Mahoney, Widerkehr & Associates, E-Mail: phyllism@widerkehr.com, Deadline: 1/7/04, www: <http://www.vlsisymposium.org>

June 17 - 19, 2004, T **IEEE Symposium on VLSI Circuits**, Location: Hilton Hawaiian Village, Honolulu, HI, USA, Contact: Phyllis Mahoney, Widerkehr & Associates, E-Mail: phyllism@widerkehr.com, Deadline: 1/7/04, www: <http://www.vlsisymposium.org>

June 21 - 23, 2004, T **Device Research Conference**, Location: University of Notre Dame, Notre Dame, IN, USA, Contact: Alan Seabaugh, University of Notre Dame, E-Mail: seabaugh.1@nd.edu, Deadline: Not Available, www: <http://www.tms.org/meetings/specialty/DRC/2004/DRC-2004home.html>

June 21 - 25, 2004, T **International Symposium on Physics & Engineering of Millimeter & Sub-Millimeter Waves**, Location: Kharkov National University, Kharkov, Ukraine, Contact: Alexander Nosich, IRE NASU, E-Mail: alex@emt.kharkov.ua, Deadline: 11/1/03, www: <http://www.ire.kharkov.ua>

June 24 - 26, 2004, T **International Conference on Mixed Design of Integrated Circuits and Systems**, Location: Hotel Orbis, Neptun S. A., Poland, Contact: Andrzej Napieralski, Technical University of Lodz, E-Mail: napier@DMCS.p.lodz.pl, Deadline: 2/29/04, www: <http://www.mixdes.org/>

June 26 - July 3, 2004, T **Korea-Russia International Symposium on Science and Technology**, Location: Tomsk Polytechnic University, Tomsk, Russia, Contact: Sergey Kalganov, E-Mail: korus@tpu.ru, Deadline: 3/29/04, www: <http://korus.tpu.ru>

\* = Sponsorship or Co-Sponsorship Support  
T = Technical Co-Sponsorship Support

@ = Alternates support between 'Sponsorship/Co-Sponsorship' and 'Technical Co-Sponsorship'  
# = Cooperation Support

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## CALL FOR NOMINATIONS

### 2003 IEEE ELECTRON DEVICES SOCIETY REGION 9 ANNUAL OUTSTANDING STUDENT PAPER AWARD

**Description:** Awarded to promote, recognize, and support meritorious research achievement on the part of Region 9 (Latin America and the Caribbean) students, and their advisors, through the public recognition of their published work in 2003, within the Electron Devices Society's field of interest: All aspects of the physics, engineering, theory and phenomena of electron and ion devices such as elemental and compound semiconductor devices, organic and other emerging materials based devices, quantum effect devices, optical devices, displays and imaging devices, photovoltaics, solid-state sensors and actuators, solid-state power devices, high frequency devices, micromechanics, tubes and other vacuum devices. The society is concerned with research, development, design, and manufacture related to the materials, processing, technology, and applications of such devices, and the scientific, technical and other activities that contribute to the advancement of this field.

**Prize:** A distinction will be conferred in the form of an Award certificate bestowed upon the most outstanding Student Paper nominated for the year. The prize will be presented the following year at one of the EDS supported conferences periodically held within Region 9. In addition to the recognition certificate, the recipient will receive a subsidy of up to \$1,000 to attend the conference where the award is to be presented. There will be a formal announcement of the winner in a future issue of the EDS Newsletter.

**Eligibility:** Nominee must be an IEEE EDS student member at the time of nomination, be enrolled at a Higher Education institution located in Region 9. In the case of a co-authored paper, only eligible co-authors may be nominated. Papers should be written in English on an electron devices related topic. Papers should have been published, in full-feature form, during the year in an internationally recognized EDS sponsored journal or conference book of proceedings. Statements by the student and by the faculty advisor should accompany the nomination. Nominator must be an IEEE EDS member. Previous winners of this award are ineligible.

**Basis for Judging:** Demonstration of Nominee's significant ability to perform outstanding research and report its results in the field of electron devices. Papers will be judged on: technical content merit, originality, structure, clarity of composition, writing skills, overall presentation. These criteria will be weighted by the assessment of the nominee's personal contribution and the linkage of the nominated work to the nominee's career plans.

**Nomination Package:**

- Nominating letter by an EDS member (It may be the faculty advisor)
- A brief one-page (maximum) biographical sketch of the student
- 1000 words (maximum) statement by the nominated student describing

the significance and repercussion of the nominated work within the wider scope of the nominee's career plans.

- 400 words (maximum) statement by the faculty advisor under whose guidance the nominated work was carried out. It should unmistakably state the faculty advisor's support of the nomination, and clearly explain the extent of the nominated student's contribution, as well as its relevance for the overall success of the reported work.
- A copy of the published paper

**Timetable:**

- Nomination packages will be due at the EDS Executive Office no later than May 15, 2004
- Recipients will be notified by July 1, 2004
- Formal presentation of the awards will take place at the ICCDCS 2004 Awards Ceremony on November 3, 2004.
- Nominations packages can be submitted by mail, fax or e-mail, but a hard copy must be received at the EDS Office.

**Send completed package to:**

IEEE Operations Center  
EDS Executive Office  
445 Hoes Lane, Piscataway, NJ 08854  
USA

**For more information contact:**

Christopher Salicco, EDS Executive Office  
c.salicco@ieee.org or 732-562-6549

## IN MEMORY OF JAMES M. EARLY

James M. Early, Fellow of the IEEE and the 1979 recipient of the Electron Devices Society J. J. Ebers Award "For Outstanding Technical Contributions to Electron Devices", died in Palo Alto, CA on January 12, 2004.

He was born in Syracuse, NY on July 25, 1922 and received his Bachelor of Science degree from the New York State School of Forestry at Syracuse University in 1943, served in the Army and then received his Ph.D. in electrical engineering from Ohio State University in 1951. He then joined Bell Labs in Murray Hill, NJ where his first task was to measure the performance of some of the first bipolar transistors made in Bell Labs. During the 1950's he made theoretical contributions to the understanding of the performance of high-speed bipolar transistors. The "Early" effect, the finite collector-current-dependent output conductance due to base narrowing, continues to be an important factor in the modeling of bipolar transistors. He remained in Bell Labs for 18 years, eventually serving as a Laborato-



ry Director in both Murray Hill, NJ and Allentown, PA, with early responsibility for the development and transfer into manufacture of integrated circuits.

Jim joined Fairchild Camera and Instruments in Palo Alto, CA in 1969 as Director of the Fairchild Research Center. While there, he directed the development of integrated circuits and charge-coupled devices, retiring in 1986.

In retirement, Jim continued his interest in devices, often attending the

EDS IEDM meetings in San Francisco. He gave the invited talk on "The History of Bipolar Transistors" at the 2002 IEDM, celebrating the 50th anniversary of the formation of the Electron Devices Society. He received 14 patents, mostly on transistors and semiconductors. I knew him as a gentleman who took the time to explain the nuances of bipolar transistors to me. He was one of the vital contributors to the early understanding and development of silicon devices and integrated circuits, technologies that today continue to be the basis of the fuel for the establishment and growth of new products and new businesses at an impressive pace. We owe much to Jim and his colleagues from those early days.

Jim is survived by his wife Mary Agnes of Palo Alto, CA and eight children.

*Alfred U. Mac Rae  
EDS Awards Chair  
Mac Rae Technologies  
Berkeley Heights, NJ, USA*

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## SUMMARY OF CHANGES TO THE EDS CONSTITUTION & BYLAWS

At its 7 December 2003 meeting, the EDS Administrative Committee (AdCom) approved changes to the EDS Constitution & Bylaws concerning its election process and various AdCom member titles. These amendments were then approved in January 2004 by the Chair of the IEEE Technical Activities Board (TAB) and will be reported to TAB at its February 2004 meeting. The changes can take effect 30 days following their publication in this copy of the Newsletter (distributed to all EDS members), unless objections are received by 5% of the

membership. The following is a summary of the changes:

- Officer Nomination and Election Process – To have a two-year President-Elect position instead of the current 1 year (max. 2 terms) Vice President position
- AdCom Nomination and Election Process – To require that at least one elected AdCom member is a Graduate of the Last Decade (GOLD Member)
- To change the title of various Standing Committee Chairs (Awards, Educational Activities, Meetings,

Membership, Publications and Regions/Chapters) to Vice President

- To change the title of the Technical Committees Chair to Vice President of Technical Activities

The complete EDS Constitution and Bylaws may be obtained from the EDS Executive Office or on the web at [www.ieee.org/eds/](http://www.ieee.org/eds/) (click on Administrative Committee).

*Cary Y. Yang  
2003 EDS Nominations and  
Elections Chair  
Santa Clara University  
Santa Clara, CA, USA*