



IEEE ELECTRON DEVICES SOCIETY

Newsletter

APRIL 2007 VOL. 14, NO. 2 ISSN:1074 1879

EDITOR-IN-CHIEF: NINOSLAV D. STOJADINOVIC

TABLE OF CONTENTS

Upcoming Technical Meetings 1

- 2007 IITC
- 2007 SISPAD
- 2007 IVNC

December 2006 AdCom

Meeting Summary3

Society News 11

- EDS Educational Activities Committee Report
- EDS Regions/Chapters Committee Report
- EDS Power Devices and ICs Committee Report
- 2006 Class of EDS Fellows Honored at IEDM
- 2006 EDS J.J. Ebers Award Winner
- 2006 EDS Distinguished Service Award Winner
- 2006 EDS Education Award Winner
- Updating of the Field of Interest of the Society
- Summary of the Changes to the EDS Constitution and Bylaws
- 25 EDS Members Elected to IEEE Grade of Fellow
- 2007 EDS Ph.D. Student Fellowship Final Call for Nominations
- EDS Distinguished Lecturers Visit Chile
- EDS Regions 4-6 Chapters Meeting Summary
- 2006 EDS Chapter of the Year Award
- In Memory of Dr. Robert Adler
- EDS Members Recently Elected to IEEE Senior Member Grade
- 2007 EDS J.J. Ebers Award Call for Nominations
- EDS DL Program - Lecturers Residing in Central, Western & South Western USA and Latin America
- 2007 EDS Education Award Call for Nominations

Regional and Chapter News 32

EDS Meetings Calendar 35

EDS All India Chapters Meeting 36

2007 IEEE INTERNATIONAL INTERCONNECT TECHNOLOGY CONFERENCE (IITC)

Celebrates 10th Anniversary in June

The annual IEEE International Interconnect Technology Conference, the world's premier forum dedicated to advancing interconnect solutions, will celebrate its 10th anniversary June 4-6, 2007, with a glance back at how interconnect technology has progressed, and a look forward toward new developments.

The conference will be held at the San Francisco Airport Hyatt Regency Hotel, conveniently located 20 minutes from both Silicon Valley and downtown San Francisco. The IITC will be preceded by a Short Course on leading-edge interconnect technology on Sunday, June 3.



The IITC conference will be held at the San Francisco Airport Hyatt Regency Hotel, conveniently located 20 minutes from both Silicon Valley and downtown San Francisco

(continued on page 6)



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

ELECTRON DEVICES SOCIETY

President

Ilesanmi Adesida
University of Illinois
E-mail: iadesida@uiuc.edu

President-Elect

Cor L. Claeys
IMEC
E-mail: c.claeys@ieee.org

Treasurer

Stephen A. Parke
Tennessee Tech University
E-Mail: sparke@tntech.edu

Secretary

John K. Lowell
Consultant
E-Mail: j.lowell@ieee.org

Jr. Past President

Hiroshi Iwai
Tokyo Institute of Technology
E-mail: h.iwai@ieee.org

Sr. Past President

Steven J. Hillenius
Semiconductor Research Corp.
E-mail: s.hillenius@ieee.org

Vice-President of Awards

Alfred U. Mac Rae
Mac Rae Technologies
E-Mail: a.macrae@ieee.org

Vice-President of Educational Activities

Paul K. L. Yu
University of California at San Diego
E-Mail: p.yu@ieee.org

Vice-President of Meetings

Jon J. Candelaria
Motorola
E-mail: jon.candelaria@motorola.com

Vice-President of Membership

Albert Z. H. Wang
Illinois Institute of Technology
E-Mail: awang@ece.iit.edu

Vice-President of Publications

Renuka P. Jindal
University of Louisiana at Lafayette
E-Mail: r.jindal@ieee.org

Vice-President of Regions/ Chapters

Juin J. Liou
University of Central Florida
E-Mail: liou@mail.ucf.edu

Vice-President of Technical Activities

April S. Brown
Duke University
E-Mail: aprilbrown@mac.org

IEEE Newsletters

Paul Doto, Paul DeSesso
IEEE Operations Center
E-Mail: p.doto@ieee.org,
p.desesso@ieee.org

Executive Director

William F. Van Der Vort
IEEE Operations Center
E-Mail: w.vandervort@ieee.org

Business Coordinator

Joyce Lombardini
IEEE Operations Center
Email: j.lombardini@ieee.org

EDS AdCom Elected Members-at-Large

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

2007	Term	2008	Term	2009	Term
J. N. Burghartz	(1)	G. Baccarani	(1)	S. S. Chung	(2)
M. J. Chan	(1)	J. Deen	(1)	R. Huang	(1)
M. Estrada del Cueto	(2)	F. J. Garcia Sanchez	(2)	R. P. Jindal	(1)
S. Ikeda	(1)	J.B. Kuo	(1)	M. Lundstrom	(2)
R. J. Nikolic	(1)	J.J. Liou	(2)	H. S. Momose	(1)
N. D. Stojadinovic	(2)	H. Shang	(1)	A. Z. H. Wang	(2)
J. J. Wesler	(1)	J. W. Swart	(1)	X. Zhou	(2)
		S. Tyagi	(1)		

NEWSLETTER EDITORIAL STAFF

Editor-In-Chief

Ninoslav D. Stojadinovic
University of Nis
E-Mail: nstojadinovic@elfak.ni.ac.yu

REGIONS 1-6, 7 & 9

Eastern, Northeastern & South-eastern USA (Regions 1, 2 & 3)

Ibrahim M. Abdel-Motaleb
Northern Illinois University
E-Mail: ibrahim@ceet.niu.edu

Central USA & Canada (Regions 4 & 7)

Jamal Deen
McMaster University
E-Mail: jamal@mcmaster.ca

Southwestern & Western USA (Regions 5 & 6)

Sunit Tyagi
Intel
E-Mail: sunit.tyagi@intel.com

Latin America (Region 9)

Jacobus W. Swart
State University of Campinas
E-mail: jacobus@ieee.org

REGION 8

Eastern Europe & The Former Soviet Union

Alexander V. Gridchin
Novosibirsk State
Technical University
E-mail: ieee@ref.nstu.ru

Scandinavia & Central Europe

Andrzej Napieralski
Technical University of Lodz
E-Mail: napier@dmcs.p.lodz.pl

UK, Middle East & Africa

Zhirun Hu
University of Manchester
E-mail: z.hu@manchester.ac.uk

Western Europe

Cora Salm
University of Twente
E-Mail: c.salm@utwente.nl

REGION 10

Australia, New Zealand & South Asia

Xing Zhou
Nanyang Technological University
E-Mail: exzhou@ntu.edu.sg

Northeast Asia

Kazuo Tsutsui
Tokyo Institute of Technology
E-mail: ktsutui@ep.titech.ac.jp

East Asia

Hei Wong
City University of Hong Kong
E-Mail: eehwong@cityu.edu.hk

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

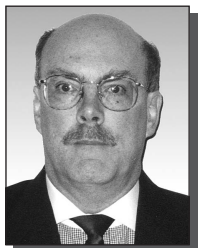
Issue	Due Date
January	October 1st
April	January 1st
July	April 1st
October	July 1st

The EDS Newsletter archive can be found on the Society web site at <https://www.ieee.org/portal/pages/society/eds/pubs/newsletters/newsletter.html>. The archive contains issues from July 1994 to the present.

IEEE Electron Devices Society Newsletter (ISSN 1074 1879) is published quarterly by the Electron Devices Society of the Institute of Electrical and Electronics Engineers, Inc. Headquarters: 3 Park Avenue, 17th Floor, New York, NY 10016-5997. Printed in the U.S.A. One dollar (\$1.00) per member per year is included in the Society fee for each member of the Electron Devices Society. Periodicals postage paid at New York, NY and at additional mailing offices. **Postmaster:** Send address changes to IEEE Electron Devices Society Newsletter, IEEE, 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331.

Copyright © 2007 by IEEE: Information contained in this Newsletter may be copied without permission provided that copies are not used or distributed for direct commercial advantage, and the title of the publication and its date appear on each photocopy.

DECEMBER 2006 AdCOM MEETING SUMMARY



John K. Lowell

The 2006 December meeting of the IEEE Electron Devices Society was called to order by President Ilesanmi "Ade" Adesida on Sunday, December 10 at the San Francisco Hilton Hotel in conjunc-

tion with the International Electron Devices Meeting (IEDM).

Executive Reports

Ade passed out "Debt of Gratitude" certificates to elected AdCom members Toshiro Hiramoto, Leda Lunardi, and H.-S. "Phillip" Wong, Juin Liou (Treasurer), Phillip Wong (Nanotechnology TC Chair), Leda Lunardi (Optoelectronics TC Chair), Mark Law (Technical Activities V-P), Cor Claeys (Regions/Chapters V-P), Steve Parke (Graduate Student Fellowship Chair), and Arokia Nathan (SRC-NAE Vice-Chair). Ron Waynant and John Lowell also received certificates as outgoing editors for the *Circuits and Devices Magazine* which closes publication in December 2006.

With the June 2006 AdCom meetings, and the 2007 Ex-Officio appointments approved, Ade's introductory remarks addressed TAB actions from the June 2006 meeting where two publications, *Nanotechnology Magazine*, and *Transactions on Biomedical Circuits and Systems* were approved for 2007. TAB also put out a "must have list" for society and council constitutions and bylaws addressing key areas of governance with which EDS is in compliance, and approved a second grant to the IEEE Product Safety Engineering Society. In reviewing the November 2006 TAB meeting, he reviewed the transformation of the IEEE Engineering Management Society into the Technology Management Council, a magazine for the Intelligent Transportation Systems Society, and progress reports from the TAB Periodicals Committee. Other TAB actions reported include a new infrastructure

model which involves the creation of an annual infrastructure account to cover indirect infrastructure costs to be funded through periodicals and conference proceedings. The model is due for approval by the IEEE Board in February 2007. Treasurer Juin Liou reports that EDS will generate a final 2006 net surplus of \$166.4K [Note: All finances given in \$US]. However, this does not include investment income so the final amount will be higher. Conference income in 2006 closed at \$470.3K, and IEEE Conference Publications Program (Book Broker) profits were \$971K. This year, EDS was charged \$980.1K in IEEE overhead costs with \$1204.5 projected for 2007. As of December 2006, our current reserve balance is \$4860.3K. While membership fees will stay fixed, AdCom approved an increase in the member prices for subscriptions T-ED and EDL of \$2 per journal.

est, a review of the mission of mini-colloquia for proposing new guidelines, initiatives to stimulate GOLD members to join EDS, a proposal to give a free subscription to the new *Nanotechnology Magazine* in 2007 & 2008 to EDS members, formalizing term limits for the T-ED and EDL editors and requesting conference budgets to include digitalization and metadata generation costs for any legacy proceedings to be added to IEEE Xplore, and changing the Student Career Guide Booklet to a DVD presentation.

Reporting for the **EDS Executive Office**, **Bill Van Der Vort**, presented its list of projects completed since the June 2006 meeting. The Office's list of accomplishments include working with the EDS President to revise the EDS Constitution and Bylaws, reviewing and preparing the proposal to join the new IEEE Technology Management



Officiating the 2006 EDS AdCom Meeting at the San Francisco Hilton Hotel are, left to right: EDS President, Ilesanmi 'Ade' Adesida, EDS President-Elect, Cor Claeys and EDS Executive Director, Bill Van Der Vort

Cor Claeys, EDS President-Elect, in his ExCom report, discussed the continuation of globalization efforts including EDS visits to Argentina, Chili, Peru, India, Bangladesh and China, a review process for the EDS financially sponsored meetings, that the Spring 2007 AdCom meetings will be in Beijing, China, June 2-3, and a motion for EDS to become a sustaining member of the Technology Management Council. Other topics reported on by Cor included that ExCom approved the new wording of the EDS Field of Inter-

Council, getting EDS & IEEE approvals for a revision of the EDS Field of Interest Statement, completing the process for an EDS Education Award, worked with EdCom on course offerings for IEEE's Expert Now Short Course venue, coordinated the efforts of the Regions/Chapters program to revitalize the Chapter Partners program, coordinated procedures for getting EDS Fellows and AdCom members to join the DL program, finalize procedures and

(continued on page 7)

UPCOMING TECHNICAL MEETINGS

2007 IEEE INTERNATIONAL VACUUM NANO-ELECTRONICS CONFERENCE (IVNC)

20th Anniversary Meeting

The IEEE International Vacuum Nanoelectronics Conference which rotates between the United States, Europe, and Asia, returns to the U.S. in 2007. The last two meetings were held in Oxford, England (2005) and Guilin, China (2006). This year's conference will be the 20th anniversary meeting. The first meeting was held in Williamsburg, VA in 1988 and was organized by Dr. Charles (Capp) Spindt of the Stanford Research Institute (now SRI International) in Menlo Park, CA, and the late Dr. Henry Gray of the Naval Research Lab in Washington, DC. The field of vacuum nanoelectronics is the brainchild of the visionary Ken Shoulders who, in 1961, proposed the basic concept and predicted most of today's applications including the field emitter display. The basic concept is cold electron emission via quantum mechanical tunneling of electrons from micromachined metallic protrusions into vacuum by applying an electric field to the protrusions. Shoulders hired a young scientist, Capp Spindt, to convert his idea into a practical device. Spindt

fabricated such a device using molybdenum for the protrusions and a novel micromachining technique and published the first result in a classic paper in 1968 in the *Journal of Applied Physics*. The device, the Spindt emitter, formed the basis for all subsequent emitter developments. Since then, the field has blossomed into a truly multidisciplinary, multinational endeavor where materials scientists, chemists, physicists, electrical engineers, and computer scientists are working together to form uniform emitting, high current emitting, and stable emitters. Applications include high frequency power amplifiers, switching devices and radiation-hardened electronics. Others are miniature X-ray probes, large area 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-inch flat panel displays, very high resolution imagers (vidicons), jumbo displays, theater, traffic, and backlights. Initially, the conference was called the International Vacuum Microelectronics Conference (IVMC)

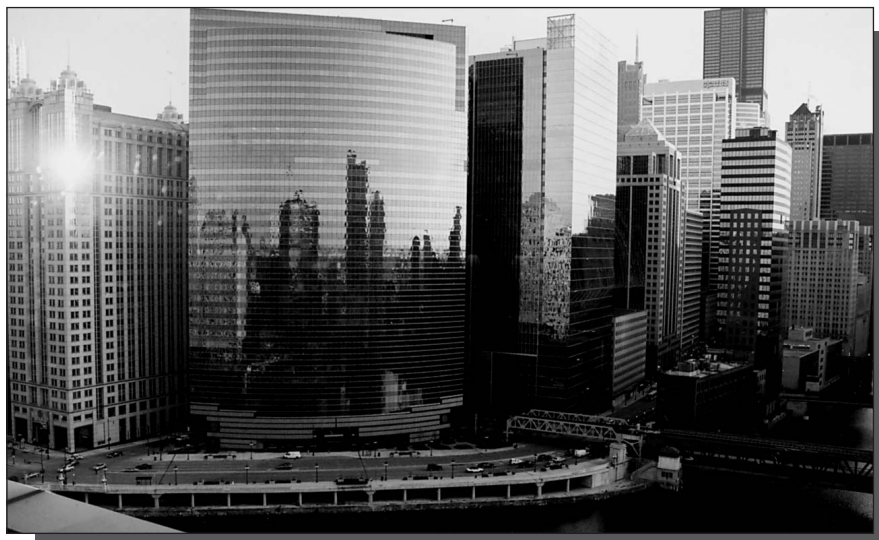
but, with the advent of nanotechnology, was changed to the International Vacuum Nanoelectronics Conference (IVNC) in 2003.

The objectives of the conference are:

- To provide an opportunity for practitioners in the field to present their work, to exchange views and ideas on current topics, and to discuss future perspectives of vacuum micro and nanoelectronics,
- To welcome all the friends in the field to experience in person the research activities around the world,
- To further promote research and product development in vacuum nanoelectronics.

Some of the topics to be covered are:

- **Theoretical considerations** of cold electron emission, miniaturized thermionic emission and field ionization including fundamental aspects of field emission, trajectories of electrons under the influence of magnetic and electric field, and beam optics
- **Field emission array fabrication and characterization** including micro- and nanotechnology-based fabrication processes, current stability, emission uniformity, emission noise, interaction with residual gases, ion bombardment, and emitter life
- **Carbon nanotube emitters** such as single wall and multi wall tubes, tubes embedded into diverse materials, and activation procedures
- **Other emitter materials** ranging from silicon, diamond, diamond like films, wide band gap semiconductors such as GaN, AlN, SiC, nano wires, rods, tubes and ribbons.
- **Displays/phosphors/spacers** such as large area displays, picture tube elements, IR imagers, low and high voltage phosphors, spacer formation and breakdown phenomena, and emission reliability



View of the Chicago River and a section of downtown as seen from the Chicago Mart Plaza Hotel

- **Vacuum encapsulation and getters** such as nano getters, getter activation, MEMS-based vacuum chamber formation and methods for measuring the pressure inside small vacuum envelopes and inside a field emitter display
- **Novel vacuum micro-and nanoelectronic devices** including sensors, X-ray catheters, large area X-ray sources, MEMS-based devices such as radioisotope-based power generators, and nanomechanical pendulums
- **Microwave amplifiers and terahertz devices.**

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. In addition, several plenary presentations will be presented by international experts. These include:

Dr. Dennis Polla from the Defense Advanced Research Project Agency (DARPA) who will talk about 'The Next Revolution in Vacuum Nanoelectronics', Professor Chad Mirkin, Institute for Nanotechnology at Northwestern University who will talk about 'Massively Parallel Dip Pen Lithography: Towards a Desktop Fab', and Dr. JongMin Kim, VP and Samsung Fellow who will talk about 'Field Emitter Display Development using Carbon Nanotubes'. In addition, the Shoulders-Gray-Spindt Award will be presented at the conference banquet honoring a student or recent graduate who presents the most innovative work. Professor Charles Hunt, UC Davis, is in charge of the award program.

The venue of the conference is the Holiday Inn Chicago Mart Plaza Hotel, www.martplaza.com, right next to the Chicago Merchandise Mart. The hotel is located in the trendy River North

section of downtown Chicago. It is near great restaurants, clubs, entertainment, and shopping establishments. The hotel, which is located on the 15th floor of the Apparel Mart, has breath-taking views of Chicago and features an indoor pool, fitness center, sauna, an American diner, lobby bar, 24-hour business center and many more amenities to accommodate the attendees. Michigan Avenue and the Chicago Art Institute are within walking distance from the hotel. The hotel is easy to reach from O'Hare Airport via public transportation.

For more information on the conference, please visit the website at www.ivnc07.org or contact the organizing committee via information@ivnc07.org.

*Heinz H. Busta
2007 IVNC General Chair
Aurora, Illinois, USA*

2007 INTERNATIONAL CONFERENCE ON THE SIMULATION OF SEMICONDUCTOR PROCESSES AND DEVICES (SISPAD)

The 12th International Conference on the Simulation of Semiconductor Processes and Devices (SISPAD 2007), will be held September 25-27, 2007, at the TU Wien, Vienna, Austria. SISPAD is technically co-sponsored by the IEEE Electron Devices Society (EDS). SISPAD provides an international forum for presenting leading edge research and development results in the area of process and device simulation. It is held annually, with the location of the conference circulating among Europe, Asia, and the U.S. SISPAD is one of the longest running conferences devoted to semiconductor modeling. Prior to the 1st SISPAD in 1996, it was known as VPAD, SISDEP, and NUPAD, held in the same three regions as the current day SISPAD. This year we will have oral presentations and poster sessions on topics such as:

- Transport in nano-structures and structures using non-conventional materials, effects of strain on carrier

transport, models of device scaling limits, quantum effects, reliability, fluctuations, and novel nano-scale devices such as QCA, SET, and molecular devices

- Continuum and atomistic approaches for process simulation, models for dopant activation and diffusion, oxidation, silicide growth, interface effects, and effects due to stress



A view of the Gloriette in the gardens of Schönbrunn Palace, one of the many splendid tourist attractions Vienna has to offer

Martin Wagner

- Equipment, topography, and lithography simulation
- Interconnect modeling and algorithms including noise and parasitic effects
- Compact device modeling for circuit simulation, including high frequency and noise modeling
- Integration of circuit, device, process simulation with applications to performance modeling of circuits
- User interfaces and visualization
- High performance computing, advanced numerical methods and algorithms, including meshing
- Simulations of new memory structures such as nano-crystal, phase change, MRAM, and devices such as microsensors, microactuators, optoelectronics devices, lasers, and flat panel displays
- Benchmarking, calibration, and verification of models and simulators

One of the unique strengths of SISPAD is its size. SISPAD attracts approximately 200 participants from around the world. The conference is the right size to allow for attendees to foster relationships and to relax

among their peers. SISPAD will have invited speakers who will present new ideas about device and process physics, demonstrate applications to leading edge technologies, and show new models for compact devices.

In conjunction with the conference, companion workshops on the modeling of organic semiconductor devices and reliability issues of interconnect materials will be offered. These workshops will cover fields in which modeling challenges have attracted a lot of attention during the last couple of years. Each companion workshop program consists of ten outstanding invited speakers who aim at covering the various challenges and potential solutions in as broad a manner as possible.

Vienna is the capital of Austria and with a population of about 2 million, by far the largest city in Austria. For many centuries Vienna has been a cultural, economic, and political center in the heart of Europe and as such a designated UNESCO World Heritage Site. The attractions that await the conference attendees are diverse. As the former seat of the Imperial Court of the Holy

Roman Empire and later the capital of the Austro-Hungarian Empire, Vienna accommodates countless historic monuments, imperial palaces, theatres, opera houses, concert halls, and museums. The permanent immigration from various parts of these empires has left its traces in all aspects of Viennese life, most notably in a unique and exquisite cuisine, ranging from the famous Wiener Schnitzel, to world-famous cakes and desserts. All of Vienna is easily reachable by a convenient and dense network of public transportation.

We cordially invite you to attend SISPAD 2007 to learn more about state-of-the-art simulation models and applications, and to enjoy the diverse culture and atmosphere of Vienna. For further information, please visit our conference web site at www.sispad.org, or send e-mail to the conference chairs.

*Tibor Grasser and
Siegfried Selberherr
SISPAD 2007 Conference Co-Chairs
Institute for Microelectronics
TU Wien, Austria*

2007 IEEE INTERNATIONAL INTERCONNECT TECHNOLOGY CONFERENCE (IITC)

(continued from page 1)

"The IITC was established as an IEEE sponsored meeting to address interconnect issues which were being recognized at that time as a major industry problem," said Harold Hosack, IITC 2007 General Co-Chair and Director of Interconnect and Packaging Sciences at the Semiconductor Research Corporation. "Initially, the conference's focus was solely on metal-dielectric systems. But while work in that area continues unabated and still comprises a significant part of the program, IITC has grown and expanded into new areas. It is the place to go for discussions and exhibits on a host of alternative technologies and ideas that may provide great benefit, such as optoelectronic systems and new conductors such as nanotubes."

The IITC is the world's leading forum where professionals in semiconductor processing, interconnect design, academia and equipment development gather, to present, discuss and debate exciting new science and technology through oral and poster presentations, exhibits and supplier seminars.

The meeting was established with the support of the IEEE Electron Devices Society to address interconnect issues from both fundamental materials viewpoints as well as system-level perspectives. Ever-increasing demands for greater circuit density and performance present enormous connectivity challenges. They have focused attention on the design, cost, performance and reliability demands placed on interconnects.

New materials, architectures, communication mechanisms and process technologies are needed, and new approaches are emerging in this rapidly evolving area to meet these challenges. The IITC facilitates progress on critical issues and technologies for the fabrication of advanced interconnects in monolithic ICs, multi-chip modules (MCMs) and state-of-the-art packages.

Short Course

The popular IITC Short Course provides a unique venue for learning and professional interaction in the interconnect area. It will address advanced interconnect process, design and reliability issues. Attendees benefit from a combination of tutorials on interconnect fundamen-

tals, briefings on the latest interconnect technology advances, and direct interaction and experts actively working in the field.

Supplier Exhibits/Seminars

Without doubt, the cost and performance of ULSI circuits strongly depend on the capability and productivity of interconnect 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.

Presentations

Oral presentations and poster papers offered during the IITC span a broad range of interconnect technology topics, including:

- **Silicides/Salicides:** Characterization, new materials, and process integration issues for metal silicide/salicides
- **Dielectrics:** Dielectric materials (low k, high k, ARCs, etc.) and deposition processes (CVD, spin-on, etc.) for interconnect applications
- **CMP/Planarization:** Dielectric/Metal CMP processes, equipment and metrology

issues, and Alternate planarization techniques.

- **Metallization:** Metal deposition processes/equipment (PVD, CVD, ALD, electroplating) and materials characterization, with particular emphasis on advanced aluminum and copper metallization.
- **Process Integration:** Multilevel interconnect processes, clustered processes, novel interconnect structures, contact/via integration, metal barrier and materials interface issues, etc.
- **Process Control/Modeling:** CMP, metal/dielectric deposition and etching processes, PVD, CVD, electroplating, etc.
- **Reliability:** Metal electromigration and stress voiding, dielectric integrity and mechanical stability, thermal effects, passivation issues, interconnect reliability prediction/modeling.
- **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.
- **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
- **Dry Processing:** Dry etching of vias, trenches and damascene structures, dry etching of metal,

dry cleaning processes, plasma induced damage, etc.

- **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 to discuss potential paradigm shifts to novel interconnect schemes.

Professionals involved in interconnect-related activities are strongly encouraged to participate in this exciting conference. Detailed information can be obtained from the IITC website: <http://www.ieee.org/conference/iitc>. For additional information and 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.

General Co-Chairs of the 2007 IITC

*Harold Hosack
Semiconductor Research Corporation
Research Triangle Park, NC, USA*

*Calvin Hsueh
Taiwan Semiconductor
Manufacturing Co.
Hsinchu, Taiwan*

*Joost Waeterloos
The Dow Chemical Co.
Leuven, Belgium*

DECEMBER 2006 ADCOM MEETING SUMMARY

(continued from page 3)

rules for the DL Certificate Recognition Program, developed funding rules document for chapters covering the DLs, mini-colloquia, and chapter-sponsored conferences, and continued dispensation of the short course videotape inventory. Also mentioned was the Office's continuing work to convert the short course videotapes to CD/DVD format, the Student Career Guide Booklet, revising the roles of the Meetings Committee, progress on establishing a Mas-

ters-level Graduate Student Fellowship, a plan to digitize legacy proceedings of the IRPS, and the VLSI Symposium for inclusion in IEEE Xplore, coordination of data to evaluate EDS meetings from both a topical and regional perspective, continued evaluation of the BCTM and CSICS conferences with the possibility of co-location, coordination of approvals for seven meetings requesting EDS support, development of both a direct mail affiliate member promo-

tion and a redesigned membership brochure, and getting AdCom members to attend selected meetings for promotion of membership. With manuscript handling, Bill's group continues to define the specifications on EDL manuscripts entered and reviewed on the web using Manuscript Central. The Executive Office has also been busy with other publications issues by working with the T-DMR staff to establish an IEEE alias list for IRPS attendees, and

completed the phase-out of C & D Magazine. Since June, Bill's group also continued work on the new electronic service called "Ask EDS" recently renamed "Quest EDS", which allows EDS members to submit technical questions to an Editor-in-Chief (Samar Saha), and finalized the proposal for the *Nanotechnology Magazine* from the Nanotechnology Council to be given to EDS members.

Vice-President Reports

Regions/Chapters V-P, Cor Claeys, discussed the formation of 4 new chapters in 2006 in addition to the current total of 123 (incl. all student chapters). Locations for 35 prospective chapters in 2007 include New York (state), Louisiana, New Mexico, Moldova, Belarus, Turkey, India, China, Brazil, Argentina, and Peru. Cor also announced that R/CPMT/ED Singapore is EDS' "Chapter-of-the-Year" for 2006. As members may recognize, this is the second time that Singapore has won this award (first time in 2003). While the efforts of this chapter are highly commendable, EDS would like to be sure that a few chapters do not dominate this category every year. Thus, a motion to change the "Chapter of the Year" Award rules to include that a winner chapter can not win again in one of the 3 subsequent years was put forth and approved.

Membership V-P, Albert Wang, showed that as of October, 2006, EDS membership stands at 10,891 members, from an 11,219 total at the end of 2005. Of these, 6,474 are regular members, 3,593 are permanent members, 800 are students, and 24 remain affiliate members. The demographics are shown in the chart below:

Albert notes that EDS membership is down by 2.9% from 2005 which par-

allels the overall drop in IEEE membership which is 2.8%. Still the fastest growing region is 10 while North American membership is losing ground. He outlined his group's efforts at recruitment such as conference onsite credit vouchers, TIP promotion, continuation of the MFSP program, ongoing Senior Membership encouragement, direct mailing programs, and material for DL promotion. Albert also reviewed recent EDS trips to India and China as well as an aggressive list of action items for membership including benefits promotion, local-level promotions, conference promotions, and student incentives. Questions were raised to whether or not EDS tracks members who have dropped out. In truth EDS does not but IEEE does and results from a dissatisfaction survey run by IEEE should be forthcoming. The fading participation in North America may be linked to chapter inactivity. Albert pointed out that the steady decline in North American membership needs to be addressed and called for all members with helpful suggestions to contact him. Recent trends indicate that people are joining IEEE but not societies. IEEE is considering making the joining of at least one society mandatory for membership. Statistics show each year that many join the IEEE without becoming affiliated with any society or council, which in the long term is detrimental to the health of the technical society. Requiring at least one society affiliation with an IEEE membership would be a positive step.

Renuka Jindal, Publications V-P, discussed "near zero" hardcopy circulation numbers for both T-ED/EDL which has exacerbated the trend in using Xplore downloads as a factor for judging publications. Also discussed was the healthy financial state of T-ED &

EDL, term limits for T-ED & EDL editors, and the closing of C & D Magazine. An issue arose as to whether or not EDS is compensated by the number of Xplore downloads and papers to which the answer is affirmative. This might also lead to an impact factor for IEDM papers which traditionally are not part of T-ED or EDL but are posted on the web and by this new trend could be subject to an impact factor. Renuka had recently championed an initiative to revise the EDS Field of Interest Statement to include bioelectronic and biomedical applications. The statement was totally rewritten to reduce the duplication in the use of the word device, and it was approved by AdCom. The new statement will now be sent to TAB for review and approval.

The new, *Nanotechnology Magazine* will have 4 issues in 2007 and 6 issues in 2008. Its objective is to publish articles covering new research and developments toward broad audience, tutorials, and surveys in the field of nanotechnology in addition to industry news, research news, education news, policy news, opinions pieces, book reviews, updates on people, introduction to new tools and techniques, funding and meetings news patent summary, and commercialization. The Nanotechnology Council is offering sponsoring societies the option of providing their respective members with free subscriptions for two years at a cost of \$2/member/year. For EDS, the approximate cost would be \$44K (\$22K per year). AdCom discussed the prospect of accepting this opportunity, and approved a motion to provide all EDS members with a free subscription to the new *Nanotechnology Magazine* in 2007 and 2008. Winners of the 2006 Rappaport award are Kailash Gopalakrishnan (IBM Almaden), Peter Griffin (Stanford), James Plummer (Stanford) and Raymond Woo (Stanford). Recipients of the Smith award for 2006 are (from Penn State Univ.) Lisong Zhou, Sungkyu Park, Bo Bai, Jie Sun, Sheng-Chu Wu, & Thomas N. Jackson, and (from Eastman Kodak Co.) Shelby Nelson, Diane Freeman, & Yongtaek Hong. A proposal to start a new journal, Transactions on Applied Compact Modeling, found difficulty in passing due to the prospective limitations of its audience.

IEEE Region	Count	% of Total
1-6 (United States)	6,045	55.5
7 (Canada)	185	1.7
8 (Europe, Middle East, & Africa)	1,899	17.4
9 (Latin America)	158	1.5
10 (Asia Pacific)	2,604	23.9
Total	10,891	100

EDS Membership Demographics for 2006 (as of 10/31/06)

EDS has distributed 280 remaining videotape stock of past IEDM Short Courses, EDS/RS Short Courses and EDS Independent Short Courses to universities, chapters, and other worthy recipients as explained by **Paul Yu, Education V-P**. Paul also announced the 2006 EDS Graduate Student Fellowship award winners namely Ravi Todi (University of Central Florida), Rimoon Agaiby (Newcastle University, UK), Wen Wu (Hong Kong University of Science and Technology), and Chi Yung Ng (Nanyang Technological University, Singapore). On the Distinguished Lecturer (DL) recognition side, EDS gave out Certificates of Appreciation to approximately 15 DLs, who have served for five years or longer, and will mail approximately 10 certificates to DLs who could not attend AdCom. He also indicated that 17 EDS Fellows have been recruited to become DLs this year. In the future, EDS will solicit all newly elected IEEE/EDS Fellows to serve as EDS DLs on an annual basis. For chapters that are doing Mini-Colloquia, Paul outlined a new procedure requiring chapters to submit funding proposals to EDS six months in advance and these will be considered separately from the DL funding program. It was also discussed that chapters should try to share the colloquia costs rather than depend on EDS to underwrite everything. A recent survey of chapters indicates that of the 27 chapters that responded, 22 currently use the EDS DL Program. Reasons for not participating include issues with fund transfers from USA, lack of success in arranging lectures, and difficulty in generating good attendance. However, most chapters said the DL program is very valuable. Paul and his group know that some improvement in DL funding and lectures are key to keeping this program as a chapter and EDS asset.

Meetings V-P, Jon Candelaria, sought approval for all EDS repeat meetings in 2008, and summarized those for 2006. EDS currently provides support for 158 meetings including 26 financially sponsored meetings, 132 that were technically co-sponsored, and none with cooperative support. Jon did express concern that for the period 2001-2006 EDS paid \$19K in late fees for conferences that did not close

The 2006 IEEE Medal of Honor was awarded to EDS member

James Meindl

(Georgia Institute of Technology)

"For pioneering contributions to microelectronics, including low power, biomedical, physical limits, and on-chip networks."

their books on time. In 2006 alone, the cost was almost \$4K.

Technical Activities V-P, Mark Law, indicated that attempts to find a suitable conference host for a mid-year "umbrella" symposium to communicate rapid research has not produced a candidate. Going forward the plan will focus on smaller, individual symposia but the financial impact of the plan needs to be studied.

Awards V-P, Al MacRae, presented a comprehensive list of EDS members recognized with major IEEE, and EDS awards in 2006, as summarized below. Al exhorted AdCom to continue being pro-active in nominating members for IEEE Awards in 2007, and to seek both geographical and technical breadth in award candidates.

Chair Reports

Cary Yang announced that Mark Lundstrom of Purdue is the inaugural recipient of the EDS Education award. As the Fellows Chair, Cary stated that from 62 nominations received 13 EDS members were promoted to Fellow grade (with 12 additional EDS members elected Fellow by other societies).

Hiroshi Iwai, who chairs the Nominations and Elections Committee, reminded the full voting members about the election to be held later that day. **Paul Yu** reviewed the progress of the *IEEE Expert Now* system started by the IEEE Educational Activities Board to develop a process to convert conference short courses or specially composed classes into 1-Hour online educational modules. Fifty-three courses are currently available including 6 initiated by EDS, and the system has generated \$500M in institutional sales in 2006. **Former EDS President, Steve Hillenius** gave a society review as Division I Director in which he touched on the subjects of IEEE membership, the state of the Society, finances, and products & services. Highlights of his presentation included discussion of "TryEngineering.org", a new educational website aimed at educating young people (ages 8-18) about engineering as a profession, that IEEE leads all societies in citation from leading patent generating companies, technical leadership and publications are prime reasons for joining IEEE, that traditional engineering enrollment is declining and being replaced by new areas, IEEE reserves rose to \$130M in 2005, infrastructure charges are a major concern, and higher grade membership is going down while non-US higher grade membership is going up. **Kaizad Miztry, Technical Chair of the 2006 IEDM**, expects almost 2000 attendees, and said the short courses were very well attended. The financials also look good with an expected surplus of \$140K to ED. **EDL**

Award	Recipient/Affiliation
IEEE Medal of Honor	James Meindl (Georgia Inst. of Technology)
IEEE Frederick Phillips Award	Lou Parrillo (Parrillo Consulting)
IEEE Reynold Johnson Award	Eliyahou Harari, Sanjay Mehrotra, and Jack Yuan (all at SanDisk)
IEEE Jun-ichi Nishizawa Medal	Hideo Sunami (Univ. Hiroshima), Mitsumasa Koyanagi (Tohoku Univ.), & Kiyoo Itoh (Hitachi)
IEEE Andrew S. Grove Award	Chang-Gyu Hwang (Samsung)
IEEE Daniel Noble Award	Carlos A. Paz de Araujo (Colorado)
IEEE Kiyo Tomiasu Award	Muhammed Alam (Purdue)
IEEE Cleo Brunetti Award	Susumu Namba (Nagasaki Institute)
EDS J.J. Ebers Award	Ghavam Shahidi (IBM)
EDS Distinguished Service Award	Steve Hillenius (SRC)
EDS Education Award	Mark Lundstrom (Purdue)

EDS Recipients of IEEE Field, and EDS Awards for 2006

Editor-in-Chief, Yuan Taur, reports that paper acceptance held at 40%. The 278 papers published this year are 3% higher than last year's numbers. Turnaround time could be 3 months if faster reviewing procedures could be put in place.

Technical Committee (TC) Reports and New Business

Bob Doering, leader of the Semiconductor Manufacturing TC, discussed the work of his group in contributing to publications and conferences in metrology in 2006 as well as playing a role in the ITRS 2006 update. They also continue to advise the T-SM staff in preparing special issues. On the nanotechnology side, **H.-S. Philip Wong's** TC kept busy supporting the IEEE Nanotechnology Council's Nanotechnology Magazine, advising EDL and T-ED editors, and reviewing EDS sponsored nanotech conferences. The group feels that they need to collaborate with nanotechnology researchers that do not currently participate in EDS activities, and to clarify EDS' role in this area since many present EDS efforts do not belong to nanotechnology. A symposium to help define this situation is in the works. In conclusion, **Bin Zhao**, VLSI Technology Chair, briefly discussed his group's adding three new members. Among their activities for 2006-2007 are conference proposal reviews, contributing to the 2006 International Technology Roadmap for Semiconductors (ITRS), workshops on new research devices, and compact modeling, assisting conferences (IEDM, ICSICT, RFID 2007), and generating T-ED special issues.

Ade Adesida then presented the recently required revisions from the IEEE Technical Activities Board adding standard text relating to the actions of the Administrative Committee, and the Nominations and Elections Committee to be added to both the Constitution and Bylaws. It was also decided to add the names of the fourteen technical committees to the by-laws as well as required by the IEEE TAB. As a house cleaning action, text from our bylaws stating a need for the Meetings committee to recognize the bylaws of the Device Research Conference has been deleted. The by-law changes were

approved by AdCom. Ade next reviewed IEEE Engineering Management Society (EMS) action to transition to a Council having just obtained final approval from TAB. In September, all IEEE societies received an invitation to join the Technology Management Council (TMC) which has retained the Field of Interest Statement of the EMS. EDS is asked to consider becoming either a sustaining or supporting member. The former is more costly but would give EDS a voice in its operations. In support of joining, it was felt that future opportunities for technology professionals require not only technical competence but some minimal level of management expertise. TMC could provide EDS members an opportunity to develop new skill sets and expertise to advance their careers as technology professionals or managers. TMC can offer EDS its well-recognized publications, an IEEE-wide management outreach network, and a venue for member societies to raise management issues. To date, nine societies have joined as supporting members. A motion to approve for EDS to join the IEEE Technology Management Council as a supporting member at a cost to EDS of a one-time entrance fee of \$5K was proposed and passed. Defeated was the motion to fund GOLD members to attend conferences. AdCom also received reports from Regions/Chapters representatives Xing Zhou (Asia & Pacific) and Jacobus Swart (Latin America).

Publication Reports

Reporting on **T-ED, Editor-in-Chief, Doug Verret**, reported that the journal is still accepting around 45-50% of its submissions with increasing submissions from Europe which overtook

the US in number of manuscripts published. Nevertheless, the ratio between US and non-US papers has reached equality. Response to a new practice of occasionally putting photos such as TEM shots on the cover of T-ED special issues has been favorable.

Speaking for T-NT, Philip Wong addressed some of the problems the publication is experiencing such as the long turnaround between submission and an initial decision as well as other growing pains for a new journal. However, in a recent survey, the impact factor of T-NT ranked higher than JSSC, JLT, and T-ED. T-NT was also ranked third among the important nanotech publications. The journal is planning several special issues in 2007.

Closing and AdCom Actions Summary

For 2007, your elected EDS officers are President, Ade Adesida, President-Elect, Cor Claey's, Treasurer, Stephen Parke (Tennessee Tech), and Secretary, John Lowell. Re-elected AdCom members include Steve Chung (National Chung Tung University, Hsinchu, Taiwan), Mark Lundstrom (Purdue), Albert H. Wang (Illinois Institute of Technology) and Xing Zhou (Nanyang Technological University, Singapore). Newly-elected AdCom members are Ru Huang (Peking University, China), Hisayo S. Momose (Toshiba, Japan), and Renuka Jindal (Univ. of Louisiana-Lafayette).

The next meeting of EDS AdCom will be on Sunday June 3, 2007, in Beijing, China.

*John K. Lowell
EDS Secretary
Lowell Consulting
Dallas, TX, USA*

Summary of EDS AdCom Actions - December 2006

Motion	Action
Approval of Minutes from June AdCom 2006	Passed
Approval of Ex-Officio Appointments for 2007	Passed
Increase subscription costs of T-ED & EDL for 2008	Passed
Amend "Chapter of the Year" Eligibility Rules	Passed
Nanotechnology Magazine Distribution (\$44K)	Passed
Approval of 2008 EDS repeat meetings	Passed
Approval of membership in IEEE TMC (\$5K)	Passed
Approval of Constitution and By-Law Changes	Passed
Approval of Amended Field-of-Interest Statement	Passed

SOCIETY NEWS

EDS EDUCATIONAL ACTIVITIES COMMITTEE REPORT



Paul K. L. Yu

The Educational Activities Committee seeks to provide opportunities and a forum for members to expand and spread knowledge of their technical fields. The Committee also

seeks to create opportunities for the Society to attract new members and to promote membership and student activities. In 2006, the Committee's membership totaled seventeen, and its members were appointed by the President to reflect the worldwide geographical spread of the Society. The Vice President for Education who chaired the committee was Paul Yu of the University of California, San Diego, USA, and the other members were: Mansun Chan (Hong Kong University of Science & Technology (HKUST), Hong Kong); Yuhua Cheng (Siliconlinx, Inc, USA); Jamal Deen (McMaster University, Canada); Arturo Escobosa, (CINVESTAV-IPN, Mexico); Agis Illiadis (University of Maryland, USA); Kevin T. Kornegay (Cornell University, USA); Kei-May Lau (HKUST); Juin Liou (University of Central Florida, USA); Mark S. Lundstrom (Purdue University, USA); Rebecca J. Nikolic (Lawrence Livermore Nat. Lab., USA); Stephen A. Parke (Tennessee Tech University, USA); Jayasimha S. Prasad (Maxim Corporation, USA); Marcel D. Profirescu (Technical University of Bucharest, Romania); Sunit Tyagi (Intel, USA); Philip Wong (Stanford University, USA); and Xing Zhou, (Nanyang Technological University, Singapore). The committee physically met during the Spring AdCom Meeting in Naples, Italy, and the Fall AdCom Meeting in San Francisco, California. In between the two meetings, committee business was conducted mostly by electronic means.

An important function of the Committee is its maintenance of a vibrant

Distinguished Lecturer (DL) Program for the Society. The DL Program exists to provide EDS chapters with a list of quality lecturers who can give talks at local chapter meetings and other occasions. Over the last few years, the DL program of our Society has been revamped and many lecturers have been appointed from all regions of the world in order to provide EDS chapters with easy access to high-quality technical talks. The listing of Distinguished Lecturers along with their topics and travel schedules is maintained on the EDS homepage. This listing is reviewed yearly and Distinguished Lecturers are required to actively perform lectures in order to remain on the roster. We recently solicited newly elected EDS Fellows as well as Fellows elected in prior years to serve as EDS Distinguished Lecturers. This year concluded with a roster of 152 lecturers (a net increase of 13 DLs). Over 161 lectures were conducted all over the world, from Budapest to Harbin, from Peru to the United States, by almost half of our Distinguished Lecturers. To arrange for a lecture, EDS chapters are encouraged to contact lecturers directly. A general guideline for the visit, but not an absolute rule, is that the lecturer should be able to include the meeting site with an already planned travel schedule at a small incremental cost to the travel plan. Alternatively, a prior coincident travel plan would not be required if the lecturer is already located within approximately fifty miles of a meeting site. Although the program seeks to minimize lecturers' travel costs by combining their visits with planned business trips, EDS will assist in subsidizing lecturers' travel as needed. In 2006, the Chapters were asked to provide feedback on the DL program for the sake of future improvements.

At past EDS AdCom Meetings, a few changes were approved in regards to the EDS Distinguished Lecturer Program. The nomination and selection process of DLs will now be approved twice a year at the June and December

AdCom Meetings. Also, each DL must now give 2 lecture talks within 2 years to remain an active EDS DL. At the December 2006 AdCom meeting, a certificate of recognition was presented to DLs who had served for 5 years.

Last year, in addition to the individual lectures, eight mini-colloquia were conducted. The mini-colloquia concept generally involves sending about 2 or more Distinguished Lecturers to travel to a region/chapter and present the latest developments in a particular technical field. In addition to promoting EDS membership, these colloquia also help local chapters promote regional technical activities. Student participation as presenters is much encouraged. The eight mini-colloquia were held in Hong Kong (SAR China), Mishima (Japan), Orlando (U.S.A), Chengdu/Wuhan/Harbin (China), Nis (Serbia), Naples (Italy), Singapore, and Bangalore/Bombay (India), respectively. Each of these chapters/regions was responsible for handling all the event arrangements, and only minimal financial support was required of EDS and was covered from the DL Program. Several mini-colloquia are already being planned for 2007, and reports on the DL Program are presented frequently in this newsletter. For more information, please contact Laura Riello of the EDS Executive Office (l.riello@ieee.org).

The Graduate Student Fellowships Program (GSFP) for Ph.D. candidates was established six years ago under the auspices of the Committee. For 2006, the Chair of the GSFP sub-committee was Stephen Parke. Four winners were selected last year, and they were presented with their awards at the IEDM in San Francisco, California. The winners were: Rimoon Agaiby (Newcastle University, United Kingdom); Chi Yung Ng (Nanyang Technological University, the Republic of Singapore); Ravi Todi (University of Central Florida, U.S.A); and Wen Wu (Hong Kong University of Science and Technology, Hong Kong). Reports on

these winners are published in this issue of the newsletter. Starting in 2007, GSFP will be expanded to include a new Masters Student Fellowship Program. This new award is for graduating college seniors and strives to reward the undergraduate research work and to encourage them to go to graduate school. Advertisements for both Fellowship programs along with the required qualifications are published in this newsletter and other EDS publications. We are appealing to all our members to advertise the program among potential candidates and nominators so that students are aware of

this opportunity for funding and recognition. With these awards, we hope to assist the very best students in our fields and to also make a positive impact on the future leaders of our Society.

The Committee worked with the IEEE Educational Activities Board (EAB) on the new Educational Products Initiative, which was launched in 2003 and entitled 'IEEE Expert Now (formerly XELL). This is a continuing education program which seeks to deliver short courses over the web. Starting January 2007, these lectures will be available to individual IEEE members at a low cost.

Lastly, the committee is continuously exploring ways and mechanisms for involving student members and Gold members in conferences and other Society activities. If you have any suggestions or information on these or any other activities that you would like us to include, please contact me at p.yu@ieee.org.

*Paul K.L. Yu
EDS Vice-President of
Educational Activities
University of California
- San Diego
San Diego, California, USA*

EDS REGIONS/CHAPTERS COMMITTEE REPORT



Cor L. Claeys

During the past year, the EDS Regions/Chapters Committee has been very active and successful in the formation of new chapters. At the end of 2006 there were in total 123 EDS chapters.

Compared to December 2005, four new chapters have been formed in Region 10 (Hangzhou China, Dhaka, Bangladesh, Indonesia and a student chapter at Tsinghua University, China). The formation of another 35 new chapters is in progress or under discussion.

Regional Chapter meetings were organized in Region 8 (Naples, Italy, June 2006) and Regions 4-6 (San Francisco, USA, December 2006). The Naples meeting, in conjunction with the EDS AdCom meeting, was preceded by a mini-colloquium. In region 10 the WIMNACT series continued with WIMNACT-10 in China (Chengdu – March 13, Wuhan-March 15, and Harbin, March 17) and WIMNACT-11 in Singapore (July 4). Other mini-colloquia with several Distinguished Lecturers were organized in Japan, India (Mumbai and Bangalore), Taiwan, Europe (MIEL, Belgrade) and the USA (Orlando, Boise, and Santa Clara). In general, the number of events organized by chapters has

been growing and in different regions extensive use has been made of the Distinguished Lecturers program. This will ensure that the successful DL program remains attractive in the future and that the number of chapters using DL presentations will further increase.

The winner of the annual EDS Chapter of the Year award went in 2006 to the Singapore Chapter.

Special attention has been given to increase the number of chapters in dedicated regions such as Region 9 (Latin America) and Region 10 (Asia & Pacific), but especially China and India. These regions have a good growth potential in microelectronics and will strongly increase their EDS activities in the coming years. Therefore, in 2006 an EDS delegation performed a promotion tour in Argentina, Peru, Chile, China and India. Presently, the formation of 9 new chapters in Region 9 (3 in Brazil, 3 in Mexico, Argentina, Chile and Peru) and 16 new chapters in Region 10 (11 in China, 3 in India, Taiwan and Sri Lanka) is under discussion or in progress.

For 2007, Regional Chapter meetings are scheduled for Region 10 (Beijing, China, June), Region 9 (Rio de Janeiro, Brazil, September) and Regions 1-3, 7 (Washington DC, USA, December). The meeting in Beijing will be combined with the EDS AdCom meeting and followed

by two mini-colloquia, while the Region 9 meeting is linked to the 22nd Symposium on Microelectronics, Technology and Devices (SBMicro). The Regions 1-3, 7 Chapters Meeting will be held in conjunction with the EDS AdCom meeting as well as the IEDM in Washington DC. The All-India Chapters meeting was held January 6th in Bangalore. In addition, several mini-colloquia are being planned in the different regions.

The well being of a chapter is directly related to the membership growth and strongly driven by the organization of activities and events in response to the expectations of its members. The chapters are there for their members and their direct involvement and participation is therefore crucial. All possible input is highly appreciated and will surely be taken into account. Since this is my last report as VP Regions/Chapters I want to thank all SRC members and chapter chairs for the fruitful collaborations during many years. I am sure that the successful operation of the Regions/Chapters committee will continue under the leadership of Juin J. Liou, the incoming Vice-President.

*Cor L. Claeys
EDS Vice-President of
Regions/Chapters
IMEC
Leuven, Belgium*

EDS POWER DEVICES AND IC'S COMMITTEE REPORT



Toshiaki Yachi

The EDS Power Devices & ICs Committee consists of fifteen members. The present members are: Toshiaki Yachi (Tokyo University of Science) – Chair, Gehan Amaratunga (University of

Cambridge), Claudio Contiero (STMicroelectronics), Taylor R. Efland (Texas Instruments), Allen R. Hefner (National Inst. Of Standard and Tech.), Noriyuki Iwamuro (Fuji Hitachi Power Semiconductor), Daniel Kinzer (International Rectifier), Oh-Kyong Kwon (Hanyang University), Ashraf Lotfi (Agere Systems), Akio Nakagawa (Toshiba), Mikael L. Ostling (KTH, Royal Institute of Technology), Johnny K.O. Sin (The Hong Kong Univ. of Science & Tech.),

Paolo Spirito (University of Napoli), Ninoslav D. Stojadinovic (University of Nis), and Richard K. Williams (Advanced Analogic Technologies).

The main functions of the technical committee are to identify new technical areas, assist and sponsor meetings, assist with publications involvement, among others. In the field of power devices, attention has been given to MOS-gated Devices, Super-junction Devices, Wide Band-gap Power Devices, such as SiC Devices and GaN Devices, and Power ICs. The International Symposium on Power Semiconductor Devices & ICs (ISPSD), is the main conference covering the field. Six of our committee members have served as the General Chair of previous ISPSDs.

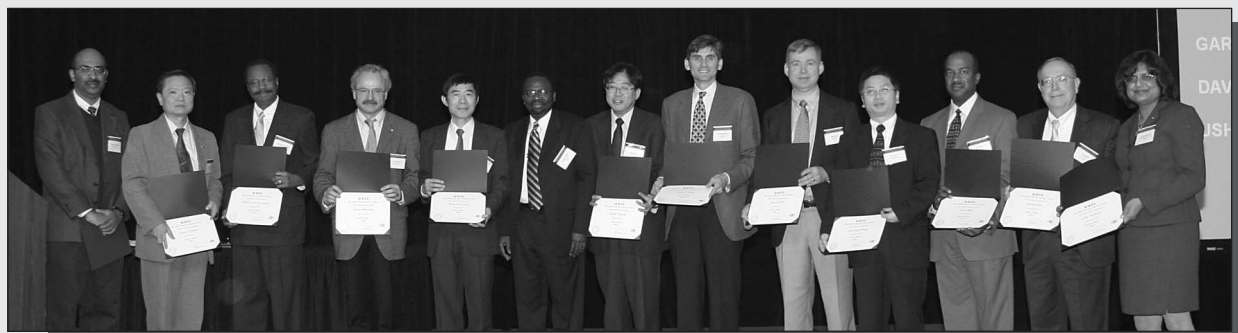
ISPSD has provided an annual international forum alternatively hosted in Asia, North America, and Europe.

ISPSD was held eighteen times from 1988 to 2006. The Technical Committee for the ISPSD has three sub-committees concerned with High Power Devices, Low Power Devices, and Power ICs, respectively. ISPSD has presented Awards to encourage researchers in this technical field, such as "Georges Charitatt Awards" for young researchers, and the best paper Award. ISPSD 2007 will be held in Jeju Island, Korea, from May 28-31, 2007. From 120 submitted papers, 32 papers were accepted for oral presentations with another 43 accepted as poster session papers. ISPSD 2008 will also be held in the USA.

*Toshiaki Yachi
EDS Power Devices &
ICs Committee Chair
Tokyo University of Science
Tokyo, Japan*

2006 CLASS OF EDS FELLOWS HONORED AT IEDM

On December 11, 2006, at the Plenary session of the IEEE International Electron Devices Meeting (IEDM) in San Francisco, CA, the 2006 EDS President, Ilesanmi Adesida, presented a number of 2006 IEEE/EDS Fellows with certificates to congratulate them on being elected IEEE Fellows. Twelve of the 25 EDS members elected to the IEEE grade of Fellow for 2006 attended the presentation.



EDS President, Ilesanmi Adesida (center, 6th from left), along with 12 EDS members who were elected IEEE Fellow for 2006 at the 2006 IEDM

2006 EDS J.J. EBERS AWARD WINNER



Ghavam Shahidi

The 2006 J.J. Ebers Award, the prestigious Electron Devices Society award for outstanding technical contributions to electron devices, was presented to Dr. Ghavam Shahidi of IBM T. J. Watson Research Center, Yorktown Heights, NY, at the International Electron Devices Meeting in San Francisco, CA, on December 11, 2006. This award recognizes Dr. Shahidi "For contributions and leadership in the development of Silicon-on-Insulator CMOS technology".

Ghavam Shahidi was born in Mashad, Iran. He received the Ph.D. degree in Electrical Engineering from the Massachusetts Institute of Technology in 1989. His Ph.D. thesis was on Non-Stationary Transport in Deep Sub-micron MOS devices.

Following graduation, he joined the IBM T. J. Watson Research Center in 1989, initially as a post-doc, to start a small exploratory program in Silicon on Insulator technology. The program was an initiative of Dr. Tak Ning of the IBM Research Division, who was interested in possible enhancements to CMOS.

Dr. Shahidi has been the key figure behind much of the technical progress in SOI technology since that time. Over the next two years, he led research which overcame the then existing problems in creating device quality SOI substrate material, developed the design point for non-fully depleted devices, and demonstrated working devices and ring oscillators. In 1992 a working 512 Kb SRAM on SOI was fabricated.

Dr. Shahidi unambiguously showed the power-delay advantage of SOI CMOS over bulk CMOS for microprocessor and SRAM applications. He recognized that SOI CMOS also had many circuit design challenges (such as the floating body effect, the self heating effect, and the switching history effect), and through both personal contributions and working with the IBM design community, understood and overcame such SOI circuit subtleties.

In 1993, Dr. Shahidi and a small group of engineers moved to the new IBM 8" wafer development line in the Semiconductor Research and Development Center (SRDC) in Hopewell Junction, NY, and continued the SOI activity under the tutelage and leadership of Bijan Davari. In 1994, the team demonstrated a working PowerPC 601 on SOI. Following that demonstration, IBM committed to take CMOS SOI through the full CMOS technology node product qualification.

Over the next few years, Dr. Shahidi and a gradually increasing group of co-

workers qualified a 250 nm SOI CMOS technology, putting in place the infrastructure for SOI (including circuit design, substrate material capability, reliability demonstration, manufacturing capability). He also engaged a number of potential customers. In 1998, the IBM AS400 Server product line was committed to SOI (in 220 nm CMOS). That was the first mainstream use of SOI.

Dr. Shahidi and his colleagues published their results widely, emphasizing both circuit and device development of SOI as a mainstream technology. He provided the leadership to drive the technology from the research stage to products, both internally within IBM and externally through his publications. SOI has been adopted by several companies as their mainstream high performance technology.

More recently, Dr. Shahidi has led the development of multiple generations of SOI CMOS technologies. In 2002, he returned to the IBM Research Division. His group now is focusing on early and research phases of the 32 nm, 22 nm, and beyond technology nodes.

Ghavam and his wife Mahshid live in Pound Ridge, NY with their daughter Leila who is 2. Ghavam enjoys gardening, and spending time with his family.

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

2006 EDS DISTINGUISHED SERVICE AWARD WINNER



Steven J. Hillenius

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 rela-

tive obscurity, with their only reward being the satisfaction that they receive in being an important part of a successful organization, namely of the IEEE Electron Devices Society. They should be thanked. The 2006 EDS Distinguished Service Award was presented to Steven J. Hillenius at the International Electron Devices Meeting in San Francisco, CA, on December 11, 2006.

Steve Hillenius was born in Hackensack, New Jersey. He received his

B. S. degree from the University of Delaware, and the Ph.D. in physics from the University of Virginia, Charlottesville, Virginia. He was an Assistant Professor of Physics at the University of Virginia from 1978 to 1981 where his research involved low temperature solid-state physics. In January of 1981 until April of 2001 he worked for Bell Laboratories. In that time he was a researcher and a research manager where he developed advanced Complimentary Metal Oxide Semiconductor (CMOS) technology. This included a symmetric CMOS technology which was the first to incorporate CoSi₂ into sub-micron CMOS as well as new structures for radiation hard devices. He also managed the research in devices and computer aided design of processing and devices for Lucent Microelectronics. During this period many novel device concepts and structures were developed, including the world's smallest transistors and new vertical transistor structures. He next became Director of the Integrated Circuit Device Technology Department for Agere Systems

which was the microelectronics division of Lucent Technologies and had been spun off as a separate company. He holds several key patents as either inventor or co-inventor in the area of microelectronics. Two of these patents were recognized by being the choice for the 2005 Agere Innovation Award, given to the Agere Systems inventor of the most commercially significant patent and the AT&T Patent Recognition Award in 1992, presented for that year's most commercially significant patent.

A third patent generated in this period is for "self powered silicon" which integrates radioactive materials into the manufacturing process to utilize nuclear decay to directly power silicon devices. In May of 2006, he left Agere Systems to join the Semiconductor Research Corporation (SRC). He is currently Vice President of Research Operations for the SRC located in Research Triangle Park, NC.

He has eight patents in the area of semiconductor device structures. He has published over 70 articles on semiconductor devices and processing. In

1996 he was elected to the grade of IEEE Fellow with the following citation: "For contributions to the field of solid-state technology and its applications to integrated circuits". He has also been involved with the planning and the road mapping for the semiconductor industry through his involvement with the Semiconductor Industry Association International Roadmap for Semiconductors and the SIA Technology Strategy Committee and currently in his position at SRC.

Steve resides with his wife Barbara, who holds an MBA and had a long, successful career in finance. They have been married for 21 years and have two children, Steven 20 and Andrew 16. Steven is currently a sophomore at Carnegie Mellon University in Pittsburgh, PA and Andrew is a junior at Cary Academy in Cary, NC. They currently reside in Morrisville, NC.

*Lucian A. Kasprzak
EDS Distinguished Service
Award Chair
Dade Behring, Inc.
Newark, DE, USA*

2006 EDS EDUCATION AWARD WINNER



Mark S. Lundstrom

At the December 2005 EDS AdCom Meeting, EDS approved a new award, the EDS Education Award. This award recognizes an IEEE/EDS Member from an academic, industrial, or government organization with distinguished contributions to education within the fields of interest of the IEEE Electron Devices Society.

The first recipient of the EDS Education Award, was presented to Professor Mark S. Lundstrom of Purdue University, West Lafayette, IN, at the International Electron Devices Meeting in San

Francisco, CA, on December 11, 2006.

Mark S. Lundstrom was born in Alexandria, a small town in central Minnesota, and received the B.E.E. and M.S.E.E. degrees from the University of Minnesota, Minneapolis, MN in 1973 and 1974. He received a Ph.D. in electrical engineering from Purdue University, West Lafayette, IN in 1980.

From 1974 – 1977, he worked at Hewlett-Packard Corporation in Loveland, Colorado, on integrated circuit process development and manufacturing support. In 1980, he joined the School of Electrical Engineering at Purdue University in West Lafayette, Indiana, where he is currently the Don and Carol Scifres Distinguished Professor of Electrical and Computer Engineering and the founding director of the Network for Computational Nanotechnology. From 1989 – 1993 he served as a director of Purdue University's Optoelectronics Research Center and from 1991 – 1994 as Assistant Dean of Engineering.

Mark Lundstrom's research centers on the physics of electronic devices. His first contributions were to the understanding of heavy doping effects in semiconductor devices and to the physics and modeling of heterojunction devices. That work helped clarify solar cell device physics and more generally produced a deeper understanding of effective bandgap shrinkage and minority carrier transport in semiconductor devices. He also made important contributions to the physics and modeling of off-equilibrium and quasi-ballistic transport in semiconductor devices, specifically heterojunction bipolar transistors. Using these ideas, he introduced a new scattering model for nanoscale MOSFETs in 1997. His approach provided a new understanding of how ultrasmall transistors operate and their scaling limits. More recently, he has studied problems in ultimate CMOS, as well as carbon nan-

(continued on page 21)

UPDATING OF THE FIELD OF INTEREST OF THE SOCIETY

As you may know, each society and council of IEEE has a Field of Interest (FOI) Statement which defines the activities that are central to that unit. Recently, changes to the EDS FOI were approved by the IEEE Technical Activities Board (see adjoining article summarizing changes to the EDS Constitution & Bylaws). Even with these changes in place, although the FOI does read differently, the tenets remain unchanged. The revised FOI reads as follows:

"The field of interest for EDS is all aspects of engineering, physics, theory, experiment and simulation of electron and ion devices involving insulators, metals, organic materials, plasmas, semiconductors, quantum-effect materials, vacuum, and

emerging materials. Specific applications of these devices include bioelectronics, biomedical, computation, communications, displays, electro and micro mechanics, imaging, micro actuators, optical, photovoltaics, power, sensors and signal processing.

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

As you will notice, the revised FOI lists the core <Activity> with <Materials> and <Applications> grouped

separately. It is our expectation that this version will convey our mission succinctly to our current and potential members as they seek to make a connection between our activities and how they apply to their daily lives. We have also explicitly articulated the word "educational" in the second paragraph to underscore its contribution to the advancement of this field.

We want to thank you for being part of this Society by continuing to participate in its activities as we reach out globally to technical professionals from diverse fields.

*Renuka P. Jindal
EDS Vice-President of Publications
University of Louisiana
at Lafayette
Lafayette, LA, USA*

SUMMARY OF CHANGES TO THE EDS CONSTITUTION & BYLAWS

At its 10 December 2006 meeting, the EDS Administrative Committee (AdCom) approved changes to the EDS Constitution & Bylaws. These amendments were then approved in January 2007 by the Chair of the IEEE Technical Activities Board (TAB) and were then approved at the IEEE Technical Activities Board meeting in February 2007. 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:

- As requested by the IEEE TAB Society Review Committee in 2004, the membership and functions of the EDS Executive Committee (ExCom) have been added to the Constitution
- As recently required by the IEEE

Technical Activities Board, standard text relating to the action of the Administrative Committee, with or without a meeting (e.g., e-mail voting) has been added to both the Constitution and Bylaws

- As recently required by the IEEE Technical Activities Board, standard text relating to the Nominations and Elections Committee operating requirements has been added to the Bylaws
- As required by the IEEE, a quorum has been defined in both the Constitution & Bylaws, as a majority of the full voting members of the Administrative Committee
- As a house cleaning action, text from our Bylaws stating a need for the Meetings Committee to recognize the Bylaws of the Device Research Conference has been deleted

- As required by the IEEE, a statement indicating that proxy voting is not permitted was included in our Constitution & Bylaws
- As required by the IEEE, a statement indicating that mail-in voting is not permitted was included in our Constitution & Bylaws

The EDS Field of Interest Statement included in the Constitution was revised and now reads as stated in the above article by Renuka P. Jindal.

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

*Ilesanmi Adesida
EDS President
University of Illinois
Urbana, IL USA*

25 EDS MEMBERS ELECTED TO THE IEEE GRADE OF FELLOW EFFECTIVE 1 JANUARY 2007

Julia Brown, Universal Display Corporation, Ewing, NJ, USA
for leadership in developing and commercializing very high performance semiconductor and organic light emitting devices

Philip Ho Chan, Hong Kong University of Science and Technology, Kowloon, Hong Kong
for contributions to the development of low-cost flip-chip technology

Yuhua Cheng, Siliconlinx, Inc., Irvine, CA, USA
for contributions to metal-oxide-semiconductor field-effect transistor modeling and its industry applications in integrated circuit design

Tat-Sing Chow, Rensselaer Polytechnic Institute, Troy, NY, USA
for contributions to smart power semiconductor devices

Charvaka Duvvury, Texas Instruments, Inc., Dallas, TX, USA
for contributions to electrostatic discharge devices and design protection methods for integrated circuit applications

Giovanni Ghione, Politecnico di Torino, Torino, Italy
for contributions to numerical physics-based modeling of passive and active integrated microwave components

Hideto Iwaoka, Yokogawa Electric Corporation, Tokyo, Japan
for leadership in developing optical devices and optical microelectromechanical systems for sensing and measuring instruments

Takayuki Kawahara, Central Research Laboratory, Hitachi Ltd., Tokyo, Japan
for contributions to low-voltage low-power random access memory circuits

Bumman Kim, Pohang University of Science and Technology, Gyeongbuk, Korea

for contributions to linear power amplifiers, gallium arsenide microwave and millimeter-wave power devices and monolithic microwave integrated circuits

Tsu-Jae King, University of California, Berkeley, Berkeley, CA, USA
for applications of silicon-germanium thin films to metal oxide semiconductor transistors and microelectromechanical systems

Isik Kizilyalli, Nitronex Corporation, Raleigh, NC, USA
for contributions to integrated circuit technology

Kenneth Kundert, Designer's Guide Consulting, Inc., Los Altos, CA, USA
for contributions to simulation and modeling of analog radio frequency and mixed signal circuits

Leo Lorenz, Siemens/Infineon Technologies, Bayern, Germany
for contributions to insulated gate and bipolar transistors modules and ultra-fast switching devices in power electronics

Mitiko Miura-Mattausch, Hiroshima University, Hiroshima, Japan
for contributions to nanoscale metal oxide semiconductor ferroelectric transistor compact modeling

Clark Nguyen, University of Michigan, Ann Arbor, MI, USA
for contributions to the physics and technology of microelectromechanical systems

Shinji Odanaka, Osaka University, Osaka, Japan
for contributions to numerical modeling and simulation of scaled common metal oxide semiconductor integrated circuit processes and devices

Aaron Oki, Northrop Grumman Corporation, Redondo Beach, CA, USA
for technical innovation in advancing gallium arsenide and indium phosphide microelectronics technology

Jayasimha Prasad, Maxim Integrated Products, San Jose, CA, USA
for contributions to compound semiconductor heterojunction bipolar transistors

Pasqualina Sarro, Delft University of Technology, Delft, The Netherlands
for contributions to micromachined sensors, actuators, and microsystems

Nava Setter, EPFL – Swiss Federal Institute of Technology, Lausanne, Switzerland
for contributions to field of ferroelectric materials, microsystems and microelectronics applications

Joseph Shappir, Hebrew University of Jerusalem, Jerusalem, Israel
for contributions to common metal oxide semiconductor process technology, and floating-gate devices

Sehat Sutardja, Marvell Semiconductor, Inc., Santa Clara, CA, USA
for leadership in design and commercialization of high-speed mixed-signal common metal oxide semiconductors integrated circuits

Scott Thompson, University of Florida, Gainesville, FL, USA
for contributions to common metal oxide semiconductor technology for high-volume manufacturing

John Wood, Freescale Semiconductor, Inc, Tempe, AZ, USA
for contributions to the nonlinear microwave device and behavioral modeling, and technology

Bin Yu, NASA Ames Research Center, Moffett Field, CA, USA
for contributions to scaling of silicon common metal oxide semiconductor transistors

Cary Y. Yang
2006 EDS Fellows Chair
Santa Clara University
Santa Clara, CA, USA



FINAL CALL FOR NOMINATIONS
2007 IEEE ELECTRON DEVICES SOCIETY
PHD STUDENT FELLOWSHIP

Description: One year fellowships awarded to promote, recognize, and support PhD 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 a student in each of the following geographical regions every year: Americas, Europe/Middle East/Africa, and Asia & Pacific. Only one candidate can win per educational institution.

Prize: US\$7,000 to the student and a 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 PhD 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 (including student's mailing address and email address)
- One copy of the student's under-graduate 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. Letters of recommendation can not be from the nominator.

Timetable:

- Nomination packages are due at the EDS Executive Office no later than May 15, 2007
- Recipients will be notified by July 15, 2007
- Monetary awards will be given by August 15, 2007
- Formal presentation of the awards will take place at the IEDM Awards Ceremony in December 2007.
- Nomination 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
EDS PhD Student Fellowship Program
445 Hoes Lane, Piscataway, NJ 08854 USA

For more information contact:

edsfellowship@ieee.org
or visit: <http://www.ieee.org/society/eds/education/fellowship.xml>

EDS DISTINGUISHED LECTURERS VISIT CHILE

In Latin American countries, EDS chapters either already exist or are in the process of being formed in Mexico, Brazil, Venezuela, Argentina, and Peru. However, it has been difficult to initiate the establishment of a chapter in Chile. Hiroshi Iwai, EDS Jr. Past President and Juin J. Liou, 2006 EDS Treasurer and 2007 EDS Regions/Chapters Vice-President, recently took a trip to Chile, visiting several universities and a company in order to promote EDS activities there.

They visited the Universidad de Chile (UC) and Pontificia Universidad de Catolica (PUC) in Santiago on November 20, Synopsys in Santiago

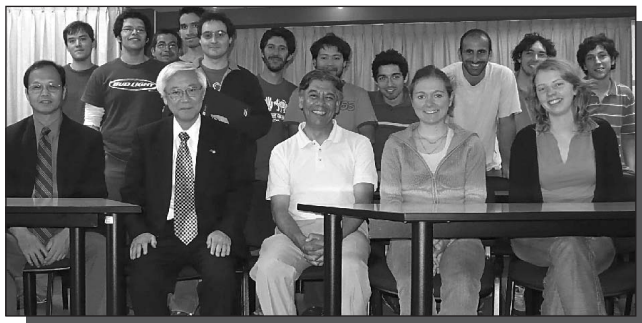
on November 21, Universidad Tecnica Federico Santa Maria (UTFSM) and Pontificia Universidad de Catolica de Valparaiso (PUCV) in Valparaiso on November 22, and Universidad del Bio-Bio (UBB) in Concepcion on November 23. They also gave Distinguished Lectures at UC, Synopsys, UTFSM, and UBB.

The 4 day tour was kindly arranged by Prof. Nicolas Beltran of UC, and we had fruitful discussions at each place. There is no big industry for electron devices at this moment in Chile, although industries for electronics, including telecommunication, information,

system control, software, etc., are very strong. There are almost 20 engineers in Synopsys and half of them are working on the electron device modeling for circuit design. Through the discussions, they said that the education of electron devices is very important in the universities and the formation of an ED chapter in Chile would be profitable to promote the educational activities by having lecturers from EDS and organizing international/domestic workshops for EDS. We will keep communications with these engineers to start the chapter in Chile.

*Hiroshi Iwai
EDS Jr. Past President
Tokyo Institute of Technology
Yokohama, Japan*

*Juin J. Liou
EDS Vice-President of
Regions/Chapters
University of Central Florida
Orlando, FL, USA*



At the UC with Prof. Nicolas Beltran and students,...



At UBB, with Prof. Jorge Salgado and students,...



At Synopsys, with Dr. Victor Grimblatt



At UTFSM, with Prof. Agustin Gonzalez,...



At Navy Club in Valparaiso with professors and UTFSM

EDS REGIONS 4-6 CHAPTERS MEETING SUMMARY



Paul K. L. Yu

On December 10, 2006, in conjunction with the 2006 IEDM, the EDS Regions 4-6 Chapters Meeting was held at the Hilton & Towers Hotel, in San Francisco, CA. Among the 39 attendees were

chapter representatives from Regions 4-6, representatives from the Rel/CPMT/ED Singapore Chapter, several chapter partners, chairs and vice-chairs of the Subcommittee on Regions and Chapters (SRC) and the EDS President.

The meeting started with an introduction by Paul Yu, Chair of the SRC-North American West (NAW) Subcommittee, who then introduced Cor Claeys, EDS Vice-President of Regions and Chapters Activities and Juin J. Liou, the incoming SRC Vice-President. Cor commented on the growth of the chapters worldwide and Juin stressed the need to revitalize the chapters in North America and to promote chapter activities.

Cor announced the winner of the 2006 Chapter of the Year Award – the Singapore Chapter, which was represented by one of its members and Chair of the EDS Region 10 SRC, Xing Zhou. For 2006, the joint chapter consisted of 166 EDS members, with 13 officers from both academia and industry. In 2006 the Singapore Chapter organized two international conferences and one mini-colloquium, in addition to several topical short courses and monthly technical meetings. Zhou attributed the success of the chapter in the past couple of years to the team work between the different

chairs (ED, CPMT and Reliability), and the close ties to the IEEE Student Branches in the region. The mini-colloquia were held at the universities with very good attendance.

NAW Vice-Chair, Albert Wang, who is also the EDS Vice-President of Membership, reported on the formation of new chapters in China and the plan for starting new chapters in China and India. He also presented the EDS membership statistics and sought ideas from the audience for promoting membership worldwide.

This meeting aimed to bring the chapter leaders within SRC-NAW together to discuss various issues confronting the chapters and their members. Eight NAW chapters (Buenaventura, California Orange County, Dallas, Milwaukee, Phoenix, Santa Clara, University of California at San Diego, and University of Illinois) reported their recent activities and their future plans.

Several of these chapters are situated in areas with strong industrial presence (for instance, Orange County, Phoenix, and Santa Clara) and their technical meetings were not short of current topics related to advanced semiconductor manufacture as well as emerging technologies such as nanotechnology. Several chapters commented on the difficulty of finding chapter officers; one chapter suggested that enlarging the executive committee eased the process of officer succession. In order to accommodate the time scheduling of Distinguished Lecturers (DLs), the Buenaventura Chapter arranged a pre-recorded DL presentation, with the DL on a conference call; the Dallas Chapter reported on its successful substitution of regular monthly chapter meetings by a topical weekly series in the months of April and November, when the local attendance of seminars tended to be high. The chapters were generally very interested in getting EDS' help in publicizing the meeting announcements on the web.

Paul Yu emphasized that the chapters and SRC should participate in the nomination of new DLs from their excellent speakers; and he discussed the supporting roles played by the

chapter partners and SRC. The mini-colloquia organized by the chapters were regarded as a very effective means to gather local members together focusing on areas of common interest. Three of the chapters in NAW (Santa Clara, Boise and Phoenix) have successfully organized one-day workshops on microelectronic devices and component manufacture and packaging. Arranging for the students' participation in the Boise mini-colloquium was pointed out as an effective means to promote chapter and membership activities. As in the case of the Singapore Chapter, the Phoenix Chapter also promoted student membership in their mini-colloquium and provided Student Scholarship funds from the colloquium surplus. While the Santa Clara Chapter held a very well attended workshop each year, they also requested assistance from EDS in streamlining the workshop registration in the future.

Finally, the two student chapters presented their reports and commented on the need to reach out to the engineering members via social activities as well as activities to reach out to high school students by stimulating their interests in science and engineering.

Paul K.L. Yu
EDS Chair SRC-NAW
University of California at San Diego
San Diego, CA, USA

Yuhua Cheng
Vice-Chair SRC-NAW
Siliconlinx, Inc.
Irvine, CA, USA

Rebecca Nikolic
Vice-Chair SRC-NAW
Lawrence Livermore Nat. Lab.
Livermore, CA, USA

Sunit Tyagi
Vice-Chair SRC-NAW
Intel
Hillsboro, OR, USA

Albert Wang
Vice-Chair SRC-NAW
Illinois Institute of Technology
Chicago, IL, USA



2006 EDS Regions 4-6 Chapters Meeting
in progress

2006 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 11, 2006, at the IEDM held in San Francisco, CA, the REL/CPMT/ED Singapore Chapter received the EDS Chapter of the Year Award, which included a certificate and check for \$1,000. The award was received by Xing Zhou, on behalf of the chapter chair, Wilson Tan.

The Chapter, formed in 1994, has been extremely active to stimulate the growth of the Society and to increase the membership value. Presently, the Chapter has 249 members, of which 166 are EDS members. Over the years the Chapter has established well-recognized events such as e.g. the annual IPFA (International Symposium on the Physical and Failure Analysis of Integrated Circuits) and EPTC (Electronics Packaging Technology Conference). In addition, well attended short courses and mini-colloquia (WIMNACT series) were organized. There is a strong industrial involvement in the Chapter's activities as reflected in the composition of the Chapters Executive Committee. Technical seminars are organized on a regular basis and Distinguished Lecturers are invited to give a presentation. The special 'Book Prize' initiative is aiming at stimulating students to join the society. There is also a strong incentive to organize joint activities with other Chapters in the region.



Xing Zhou accepting award from EDS President, Ilesanmi Adesida, on behalf of Singapore Chapter

Cor L. Claeys

*2006 EDS Vice-President of Regions/Chapters
IMEC
Leuven, Belgium*

2006 EDS EDUCATION AWARD WINNER

(continued from page 15)

otube, and semiconductor nanowire electronics, which may complement ultimate CMOS technology. This work makes use of quantum transport simulations using the nonequilibrium Green's function approach. Researchers across the world use his simulation tools and techniques.

Professor Lundstrom believes that research and education should not be separated. His work is also characterized by a close connection to experimentalists and to industry. Early in his career, Lundstrom wrote the textbook, *Fundamentals of Carrier Transport* (2nd Ed., Oxford, 2000), which has become the standard text for engineers in the field of carrier transport. More recently, he has championed the development of new educational approaches that help students and professionals think about nanoscale electronic devices from a

fresh perspective. Lundstrom has also been in the application of new technologies to facilitate education. With his colleagues, José Fortes and Nirav Kapadia, Lundstrom established the PUNCH project, an early example of cyberinfrastructure that provided simulation services to researchers and educators. That work led directly to the NSF-funded Network for Computational Nanotechnology, a team of seven universities with a mission to provide online services for research and education in nanotechnology. As director of the NCN, he addresses these challenges in research, education, and leadership, and he works with his colleagues, Gerhard Klimeck and Michael McLennan, to develop, and deploy, and support the nanoHUB, a unique science gateway that provides services for online simulation, education, and collaboration.

The nanoHUB has become a major resource for the nanoelectronics community and is widely recognized as a demonstration of how cyberinfrastructure can enable high-quality research and education. Professor Lundstrom, himself, has an entire course available on the nanoHUB, as well as numerous seminars, tutorials, and simulation tools.

Mark and his wife, Mary, live in Lafayette, Indiana. They have two boys, one who lives and works in Cincinnati and another who is a senior at Purdue University. In their spare time, the Lundstroms enjoy traveling, Civil War history, and Frank Lloyd Wright architecture.

*Cary Y. Yang
EDS Education Award Chair
Santa Clara University
Santa Clara, CA, USA*

IN MEMORY OF DR. ROBERT ADLER

The ultrasonics community lost one of its most prolific inventors when Robert Adler passed away on 15 February 2007 in Boise, Idaho USA at the age of 93. His loss marks the culmination of an illustrious career spanning seven decades that led to pioneering contributions in vacuum tubes, ultrasonics, acoustooptical interactions, and surface acoustic waves and their applications to the electronics industry, consumer electronics, and communications equipment.

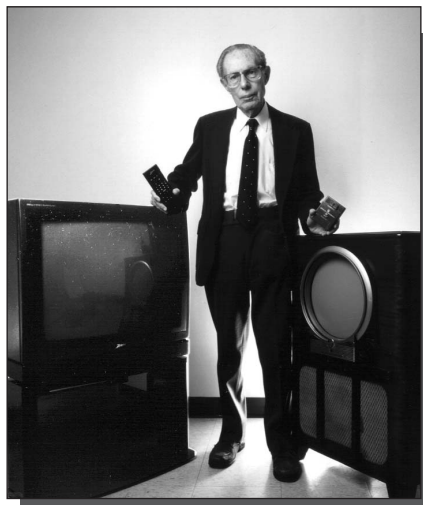
Robert Adler was born in Vienna in 1913. After receiving his doctorate in physics in 1937 from the University of Vienna, Austria, he became engaged in patent work there, and later went to England. After the war broke out, he came to Chicago and worked first in the field of measuring instruments. He joined Zenith Radio Corporation in 1941. Ten years later he was made Associate Director of Research, Vice President in 1959, and Director of Research in 1963.

In addition to his own research, in the thirty-seven years after he joined the research group at Zenith, he played an increasingly important role in forging one of the great industrial research teams in the U.S., at times numbering more than three hundred people. When economic exigencies compelled a drastic retrenching of this activity, rather than preside over it, Adler resigned his post in 1978. He became Vice President of Research of the Extel Corporation in Northbrook, Illinois until 1982. Always committed to the continuing education of engineers, Adler was also adjunct professor of electrical engineering at the University of Illinois at Urbana.

Never one to actually retire, Dr. Adler remained a technical consultant primarily with Zenith, until 1999 when Zenith merged with LG Electronics Inc., and Elo TouchSystems.

His early work was concentrated in new types of vacuum tubes, including the phasitron modulator used in early FM transmitters, receiving tubes for FM detection and color demodulation, transverse-field traveling wave tubes, and the electron beam parametric amplifier. His numerous contributions

to ultrasonics technology include the first electromechanical IF filter and the development of ultrasonic remote control devices for television receivers which remained in use until about 1980 when infrared LEDs and phototransistors replaced ultrasound. He was active in the fields of acoustooptical interaction (light deflectors for image scanning), acoustic surface waves (filters and amplifiers) and the optical video



Robert Adler – Scientist, Engineer, Teacher, and Inventor 1913 - 2007

disc. His recent work has largely been in the field of display devices and touch systems for displays employing surface acoustic waves.

Dr. Adler developed the gated-beam tube which represented a new concept in receiving tubes. His noise-gated synch clipper and automatic gain control secured stability of television reception in the fringe areas. His contribution to low-noise traveling-wave tubes was important in military communications. Later he applied the new principle of parametric amplification to electron beams which was at the time the most sensitive practical amplifier for ultra high frequency (UHF) signals. It was used by radio astronomers in the United States and abroad.

Electromechanical devices always interested Adler. During World War II he worked on high-frequency magnetostriuctive oscillators. Remote control

of television receivers by an ultrasonic gong grew out of this work. Interest in the interaction between light and ultrasound led to new ways of deflecting and modulating laser beams, using Bragg diffraction for television displays and in high-speed printing. Adler pioneered the use of surface acoustic waves in intermediate frequency filters for color television, a technology that has since become universal, not only in television but as an essential building block of cellular telephone handsets. Concurrently he devoted attention to optical video disc players.

Dr. Adler also pioneered the use of surface acoustic wave (SAW) technology for touch screens. Since the early 1990s, as a consultant to Elo TouchSystems, he actively contributed to the commercialization and further innovation of his SAW touch screen invention.

A prolific inventor with a seemingly never-ending thirst for knowledge, his pioneering developments spanned from the Golden Age of Television into the High-Definition Era, earning him more than 180 U.S. patents. The U.S. Patent and Trademark Office published his most recent patent application, for advances in touch-screen technology, on 1 February 2007.

"Bob Adler was an unparalleled technical contributor, leader, adviser and teacher," said Jerry K. Pearlman, retired Zenith chairman and CEO, who knew Dr. Adler for 35 years. "His gifts and passions were many, his mentoring matchless and his ego totally nonexistent."

In 1951, Dr. Adler became a Fellow of the Institute of Radio Engineers (now IEEE) "for his development of transmission and detection devices for frequency modulated signals and of electro-mechanical filter systems." He received the IEEE Outstanding Technical Achievement Award in 1958 for his "original work on ultrasonic remote controls" for television, the Inventor of the Year award from George Washington University in 1967, the IEEE Outstanding Achievement Award in Consumer Electronics in 1970, the Outstanding Technical Paper Award from the Chicago Section of the IEEE in 1974

for his report on "An Optical Video Disc Player for NTSC Receivers," representing early work in what was to become the digital video disc or DVD. He was the recipient of the IEEE Edison Medal in 1980 "For many inventions in the fields of electronic beam tubes and ultrasonic devices, and for leadership in innovative research and development." In 1981, he received the IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society Achievement Award for "insight, innovation, and leadership given to ultrasonics technology."

Together with Eugene Polley and other Zenith engineers, he was honored in 1997 by the National Academy of Television Arts and Sciences with an Emmy award for Zenith's introduction of the first wireless TV remote controls 50 years ago. He was a charter inductee in the Consumer Electronics Hall of Fame in 2000.

Also in 2000, Dr. Adler was inducted into the National Academy of Arts and Sciences Chicago/Midwest Chapter's "Silver Circle," which recognizes "outstanding individuals who have devoted a quarter of a century or more to the television industry and have made a significant contribution to Chicago broadcasting."

He was an avid reader. He loved his cats and laughter. He obtained his pilot license in the 1950's and was an enthusiastic flier. He was as passionate about hiking and skiing as he was about science and the arts. He was an avid downhill skier until age 89, and was still hiking in the past year.

Robert Adler is survived by his wife Ingrid (nee Koch) Adler.

Jan Brown
JB Consulting
West Whately, MA, USA

[Editor's Note: This biography was excerpted from personal biographies written by Robert Adler over the years, two formal biographies written in 2000 and 2007 by John Taylor, LG Electronics USA, Inc., (Formerly, Zenith Electronics Corp.), the UFFC Archives, the IEEE History Center and a multitude of news stories found on the internet from all over the world....

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

Alexandre Acovic	Kiyohisa Fujinaga	Max Lemme
Steven Adler*	Roland Gesche	Zhongmin Li
David Alexander	Andreas Goertler	Hsiang Lung*
Brian Aull	Subhadra Dutta Gupta	Khee Yong Lim
Chris Auth*	Douglas Hall	William Mackie
Christian Borgert	Alkiviades Hatzopoulos	Bjarne Malsnes
Gian-Franco Dalla Betta	Eishi Ibe*	Makoto Nagata
Christophehr Bower	Adrian Ionescu*	Anthony O'Neill*
Zhiyuan Cheng	Christoph Jungemann	Jagdish Prasad
Yu-Ting Cheng*	Savas Kaya	Stewart Rauch*
Mrinal Das	Sun Oo Kim	Rengarajan Vanderschaaf
Tobias Delbruck	Shin-I Kimura	Larry Rowland
Mark Durlam	Tom Kjode	Thomas Schiml
John Epler	Gregory Kovacs*	Dragica Vasileska
David Fork	Dallas Lea	Kevin Zhang

* = 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. Upon request, a letter will be sent to employers, recognizing this new status.

For more information on senior member status, visit <http://www.ieee.org/web/membership/senior-members/status.html>. To apply for senior member status, fill out an application at <http://www.ieee.org/organizations/rab/md/smelev.htm>.

2007 EDS J.J. EBERS AWARD CALL FOR NOMINATIONS

The IEEE Electron Devices Society invites the submission of nominations for the 2007 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 IEEE 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/eds/. The deadline for the submission of nominations for the 2007 award is 1 July.

EDS DISTINGUISHED LECTURER PROGRAM - LECTURERS RESIDING IN CENTRAL, WESTERN & SOUTH WESTERN USA AND LATIN AMERICA

The EDS Distinguished Lecturer Program exists for the purpose of providing EDS Chapters with a list of quality lecturers who can potentially give talks at local chapter meetings. To arrange for a lecture, the EDS chapters should contact the Distinguished Lecturer directly. A general guideline for the visit, but not the absolute rule, is that the lecturer should be able to include the meeting site with an already planned travel schedule at a small incremental cost to the travel plan. Alternatively, a prior coincident travel plan would not be required if the lecturer is already located within an approximate fifty mile radius of a meeting site. Although the concept of the program is to have the lecturers minimize travel costs by combining their visits with planned business trips, EDS will help subsidize lecturer travel in cases where few/no lecturers will be visiting an area and/or a chapter cannot pay for all the expenses for a lecturer trip. For a full listing of EDS Distinguished Lecturers and travel plans please contact Laura Riello of the EDS Executive Office (Tel: 1-732-562-3927, Fax: 1-732-235-1626, E-Mail: l.riello@ieee.org).

ILESANMI ADESIDA

Tel: +1 217 244 6379
E-Mail: i.adesida@ieee.org
Fax: +1 217 244 6375

- GaN Processing and Devices
- Advanced Fabrication Techniques for Heterostructure FETs
- High Speed Optoelectronic Integrated Receivers for Fiber Optical Communications

RAMESH K. AGARWAL

Tel: +1 314 935 6091
E-Mail: rka@me.wustl.edu
Fax: +1 314 935 4014

- Application of Computational Fluid Dynamics Based Technology to Computational Electromagnetics
- Application of CFD Based Technology to Computational Electromagnetics and Semiconductor Device Simulations
- Numerical Simulation of Partial Differential Equations (PDEs) of Computational Physics on Parallel Computers

MUHAMMAD ASHRAFUL ALAM

Tel: +1 765 494 5988
E-Mail: alam@purdue.edu
Fax: +1 765 494 6441

- Reliability Physics: How, when, and why transistors break
- Nanocomposites for Macroelectronic Applications: A Novel material for large area in electronics (e.g. displays, radars, etc.)
- Theory of Nanobiosensors for inexpensive (differential) genome sequencing

NARAIN D. ARORA

Tel: +1 408 715 8502
E-Mail: narain@cadence.com
Fax: N/A

ROBERT BAUMANN

Tel: +1 972 995 1432
E-Mail: rbaum@ti.com
Fax: +1 972 995 2770

- Radiation effects on devices
- General device reliability

ZEYNEP CELIK-BUTLER

Tel: +1 817 272 1309
E-Mail: zbutler@uta.edu
Fax: +1 817 272 7458

- Scalable, Compact Noise Models for Advanced and Bipolar Devices
- Infrared Sensors on Flexible Substrates (Smart Skin)
- Noise and Reliability in Advanced Microelectronic and Nanoelectronic Devices

ANTONIO CERDEIRA ALTUZARRA

Tel: +52 5 747 73780
E-Mail: cerdeira@mail.cinvestav.mx
Fax: +52 5 574 77114

- Device Modeling and Extraction Procedures
- The Non-linear harmonic Distortion in devices and circuits

YUHUA CHENG

Tel: +1 714 585 5707
E-Mail: yuhua.cheng@siliconlinx.com
Fax: N/A

- Device Modeling for Mixed-Signal/ RF Circuit Design
- The Influence and Modeling of

Process Variation and Device Mismatch for Analog/RF Circuit Design

- Characterization and Modeling of MOSFET Flicker Noise for RF IC Design

VIKRAM L. DALAL

Tel: +1 515 294 1077
E-Mail: vdalal@iastate.edu
Fax: N/A

- Photovoltaic Energy Conversion
- Solar Energy Conversion
- Nanocrystalline Si-based electronic materials and devices

HECTOR J. DE LOS SANTOS

Tel: +1 310 259 0767
E-mail: hector.delossantos@ieee.org
Fax: N/A

- Applications and Trends in RF MEMS-NanoMEMS

CARLOS H. DIAZ

Tel: +1 408 382 8029
E-Mail: chdiaz@tsmc.com.tw
Fax: +1 408 382 8181

- CMOS Technology Trends for MS-RF System-On-Chip
- Sub 100nm CMOS Technology

PAUL E. DODD

Tel: +1 505 844-1447
E-Mail: pedodd@ix.netcom.com
Fax: +1 505 844 2991

MAGALI ESTRADA DEL CUETO

Tel: +52 5 747 7000
E-Mail: mestrada@ieee.org
Fax: +52 5 747 7114

- Alternative Dielectrics for Ultrathin MOS Devices

- Modeling Fabrication and Characterization of Amorphous and Polycrystalline TFTs
- Dielectrics for Submicrometric Devices
- Modeling of Amorphous and Polycrystalline TFTs

FRANCISCO J. GARCIA SANCHEZ

Tel: +58 212 906 4010
E-Mail: fgarcia@ieee.org
Fax: +58 212 906 4025

- MOSFET Evolution and Trends
- Parameter Extraction Techniques in MOSFET Modeling
- Applications of the Integral Difference Function to Parameter Extraction

LARRY HORNBECK

Tel: +1 214 567 9844
E-Mail: l-hornbeck@ti.com
Fax: +1 214 567 5454

RENUKA P. JINDAL

Tel: +1 337 482 6570
E-Mail: r.jindal@ieee.org
Fax: +1 337 482 6569

- Approaching Fundamental Limits on Signal Detection: Devices and Principles
- Nano-FET Fluctuation Physics

ASHOK K. KAPOOR

Tel: +1 650 856 4025
E-Mail: akkmail1@comcast.net
Fax: N/A

- Limitations to scaling of transistors
- Growth of semiconductor technology driven by the needs of the information technology
- BiCMOS Technology

DIM-LEE KWONG

Tel: +1 512 471 5922
E-Mail: dlkwong@mail.utexas.edu
Fax: +1 512 471 4345

- Si NarrowWire CMOS devices & their applications to BioSensors
- High Speed Interconnect Using CMOS Photonics
- High-K/Metal Gate CMOS Technology Challenges
- Pushing CMOS Scaling via Novel Materials Added to Si

JACK C. LEE

Tel: +1 512 471 8423
E-Mail: jacklee@uts.cc.utexas.edu

- Fax: +1 512 471 8982
- High-K Dielectrics for CMOS Applications
 - Alternative Channel Materials

TSU-JAE KING LIU

Tel: +1 510 643 9251
E-Mail: tking@eecs.berkeley.edu
Fax: +1 510 642 2739

- Sustaining the Si Revolution: Challenges and Opportunities

MARK S. LUNDSTROM

Tel: +1 765 494-3515
E-Mail: lundstro@purdue.edu
Fax: +1 765 494 6441

- Nanoscale Transistors: Ultimate Silicon and Beyond
- Nanowire/Nanotube Transistors: Physics, Status, and Prospects
- Nanotechnology: Now or Never?

KARTIKEYA MAYARAM

Tel: +1 541 737 2972
E-Mail: karti@eecs.oregonstate.edu
Fax: N/A

- Modeling and Analysis of Substrate Noise Coupling in Mixed-Signal ICs
- Coupled Device and Circuit Simulation
- Simulation of Multi-Technology Micro and Nano Systems

ENRIQUE MIRANDA

Tel: +54 11 4631 7208
E-Mail: emirand@fi.uba.ar
Fax: +54 11 4331 0129

- Reliability of ultra-thin gate oxides
- Conduction mechanisms in dielectrics

ARTURO MORALES-ACEVEDO

Tel: +52 5 747-3781
E-Mail: amorales@gasparin.solar.cinvestav.mx
Fax: +52 5 747-7114

- Fabrication of Silicon Oxynitride Thin Films to be Applied in the Microelectronics Industry
- Polycrystalline and Amorphous Thin Films for Photovoltaic Devices

YOSHIO NISHI

Tel: +1 650 723 9508
E-Mail: nishi@ee.stanford.edu
Fax: N/A

- Nanoelectronic Devices and Materials

- Nonvolatile Memory Devices and Materials

ADELMO ORTIZ-CONDE

Tel: +58 212 906 4010
E-Mail: ortizc@ieee.org
Fax: +58 212 906 4025

- Modeling and Parameter Extraction Techniques in Semiconductor Devices
- Evolution and Trends of SOI MOSFET

JAYASIMHA S. PRASAD

Tel: +1 408 965 8178
E-Mail: jayasimha_Prasad@maximhq.com
Fax: +1 408 933 1350

- Heterojunction Bipolar Technology and Applications
- Low Frequency and High Frequency Noise in Bipolar Transistors

SAMAR SAHA

Tel: +1 650 584-2894
E-Mail: samar.saha@synopsys.com
Fax: N/A

- Design and Characterization of Nanocrystal Non-Volatile Memory Cells
- Advanced Compact Models and TCAD Methodology for Nanoscale Circuit Analysis
- Modeling Parametric Variations in 45-nm Technology and Beyond

DIETER K. SCHRODER

Tel: +1 480 965 6621
E-Mail: schroder@asu.edu
Fax: +1 480 965 8118

- Negative Bias Temperature Instability in p-Channel MOSFETS
- Some Recent Advances in Contactless Measurements
- Surface Charge Semiconductor Characterization

KRISHNA SHENAI

Tel: +1 312 996 2633
E-Mail: k.shenai@ieee.org
Fax: +1 312 996 0763

- Power Management of Wireless Devices
- High Power Semiconductor Devices and Applications

AYMAN M. SHIBIB

Tel: +1 310 726 8393
E-Mail: a.shibib1@irf.com

Fax: +1 310 563 1479

- Smart Power Technology and Applications
- High Voltage Integrated Circuits
- Power ICs in Telecommunications
- Dielectric Isolated Integrated Circuits
- Silicon-On-Insulator Technologies and Devices
- Reliability Issues in High Voltage ICs
- Event-Upset (SEU) Radiation Hardening of DMOSs BCD MOS Technologies

COSTAS J. SPANOS

Tel: +1 510 643 6776

E-Mail: N/A

Fax: +1 510 642 2739

JOHANNES (HANS) M.C. STORK

Tel: +1 972 995 2371

E-Mail: j.stork@ieee.org

Fax: +1 972 995 1480

- The realities of System-on-Chip Integration
- Economies of Scaling

JACOBUS W. SWART

Tel: +55 19 3788 4873

E-Mail: jacobus@fee.unicamp.br

Fax: +55 19 3788 4873

- Thin dielectric gate materials and processes

- Plasma processes for microfabrication
- Microsensors

ALBERT Z.H. WANG

Tel: +1 312 567 6912

E-Mail: awang@ece.iit.edu

Fax: +1 312 567 8976

- Advanced ESD Protection for Integrated Circuits

BURNIE WEST

Tel: +1 408 635 4720

E-Mail: burnell_west@credence.com

Fax: +1 408 635 4997

- Test System Architecture
- Design-to-test Flow
- Open Source Software Tools
- Open Architecture for ATE
- both software and hardware

PHILIP H.S. WONG

Tel: +1 650 725 0982

E-Mail: hspwong@stanford.edu

Fax: N/A

- Nanoscale Devices and Fabrication

JASON C.S. WOO

Tel: +1 310 206 3279

E-Mail: woo@ee.ucla.edu

Fax: +1 310 206 8495

- Nanoelectronics, ultra-scaled CMOS

DONALD C. WUNSCH II

Tel: +1 573 341-4521

E-Mail: dwunsch@ece.umn.edu

Fax: +1 573 341-4532

CARY Y. YANG

Tel: +1 408 554 6814

E-Mail: c.yang@ieee.org

Fax: +1 408 554 5474

- On-chip Interconnect Modeling
- Carbon Nanotube Interconnects

BIN YU

Tel: +1 650 604-5768

E-mail: byu@mail.arc.nasa.gov

Fax: +1 650 604-5244

- Nanoscale CMOS Transistor Scaling: Towards 10nm Gate Length
- Nanotechnology: Potential Challenger to Silicon CMNOS?
- 1-D Nanowire and Molecular-Wire for Computing and Data Storage

PAUL K.L. YU

Tel: +1 619 534 6180

E-Mail: p.yu@ieee.org

Fax: +1 619 534 0556

- Recent Advances in Photonic Devices for RF/Wireless Communication Application

2007 EDS EDUCATION AWARD CALL FOR NOMINATIONS

The IEEE Electron Devices Society invites the submission of nominations for the 2007 Education Award. This award is presented annually by EDS to honor an individual(s) with distinguished contributions to education within the fields of interest of the IEEE Electron Devices Society. The recipient(s) is awarded a certificate and a check for \$2,500, presented at the IEEE International Electron Devices Meeting (IEDM).

Nomination forms can be found on the EDS web site at www.ieee.org/eds or they can be requested from the EDS Executive Office via:

Telephone: (732) 562-3927

Fax: (732) 235-1626

E-Mail: l.riello@ieee.org

The **completed** nomination form should be sent to:

IEEE Operations Center
Att: Laura Riello
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331 USA

The deadline for the submission of nominations for the 2007 award is **1 October 2007**.

REGIONAL AND CHAPTER NEWS

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

2006 IIRW

- by Hirsch T. Goffman

IIRW Deals With a Wide Spectrum of Semiconductor Reliability Challenges

The 2006 IEEE International Integrated Reliability Workshop (IIRW), sponsored by the IEEE Reliability Society and the IEEE Electron Devices Society, was held at the Stanford Sierra Camp on the shore of Fallen Leaf Lake near South Lake Tahoe, CA, October 16-19, 2006. This workshop provides a unique forum for open and frank discussions of all areas of reliability research and technology for both present and future semiconductor applications and was chaired by John Conley, Jr., of Sharp Labs of America. The Technical Program of the 2006 workshop was organized by Yuan Chen of Jet Propulsion Laboratory, and focused on the main topic areas of: designing-in-reliability (products, circuits, and processes), customer product reliability requirements, root cause defects, physical mechanisms, and simulations, identification and characterization of new reliability effects, deep sub-micron transistor and circuit reliability, wafer level test and test structures.

Jose Antonio Maiz, Intel Fellow, Technology Manufacturing Group Director, Logic Technology Quality &

Reliability, gave the Keynote Presentation entitled, "Reliability Challenges: Preventing Them from Becoming Limiters to Technology Scaling. In this address, an analysis of the key technology and reliability trends with a potential to slow down technology scaling were discussed along with key concerns for some of the proposed options. The research opportunities and directions that will contribute to removing or minimizing reliability as a scaling limiter were analyzed. Key Messages were aggressive technology scaling continues, according to Moore's law, many new materials, transistor & design architectures will be introduced to support continuation of scaling, major changes in circuit design and chip architecture will also be needed to address process, power, and reliability issues, and early engagement & close coordination between Process, Design, Layout & Reliability functions will be critical to success. "Creativity and Innovation will be the key to success".

The technical program included paper sessions on (NBTI) Negative Bias Temperature Instability, Interconnects, Mixed Signal Devices, Transistor Reliability, Memory Reliability, Products Reliability, Wafer Level Reliability, and High-K Dielectrics. In addition, eight separate Tutorials were presented by world-class experts on a variety of topics such as Image sensors, Reliability issues, Dielectrics, NBTI, Phase Change memory, Qualification strategy, Copper Electro-migration, & High-K in Back End. The workshop evenings featured four moderated

Discussion Groups and two open Poster sessions, all with refreshments provided to stimulate open discussion. A wide range of attendees from commercial semiconductor manufacturers to universities and government organizations were represented. The workshop schedule included a Wednesday afternoon break to allow participants to take advantage of the Stanford Camp's unique mountain setting's recreational opportunities. Selected papers will be published in a special proceedings issue of the *IEEE Transactions on Device and Materials Reliability*.

Next year's workshop will be held at the same Stanford Sierra Camp location October 15-18, 2007. We invite you to submit a presentation proposal that addresses any integrated semiconductor related reliability issue. The Paper and Poster Abstract Submission deadline is July 13, 2007. Please email your Abstract to the 2007 IIRW Technical Program Chair: Patrick Lenahan, Pennsylvania State University pmlesm@engr.psu.edu. More details and information about IIRW and the location can be found at <http://www.iirw.org>.

2007 WMED

- by Steve Groothuis

The IEEE/Electron Devices Society (EDS) Boise Chapter is sponsoring the fifth annual IEEE Workshop on Microelectronics and Electron Devices on April 20, 2007 in Boise, Idaho. The workshop will provide an opportunity to attend tutorials, hear distinguished speakers, and learn about current research on microelectronics devices and related topics, and network with colleagues from universities and microelectronics companies throughout the Pacific Northwest.

Microelectronics involves the fields of materials, processes, physics, devices, circuits, packaging, reliability, and manufacturing. Technical presentations discussing new research and applications in nan-



2006 IIRW Participants Group

otechnology have also been presented. Presentation of microelectronic devices such as ASIC, microprocessors, CMOS image sensors, and semiconductor memory devices such as DRAM, SRAM, and nonvolatile devices (e.g., Flash, Phase Change, etc.) have been presented in the past few years.

The workshop is co-sponsored by IEEE Electron Devices Society, along with Boise State University's College of Engineering, the Boise EDS Chapter, and the Micron Foundation.

This one-day event offers both technical sessions and tutorials for one inclusive registration fee. Participants will have a good opportunity to get to know each other in informal, relaxed settings.

This workshop will consist of invited talks, contributed papers, tutorials, as well as a poster session throughout the afternoon. Faculty, students, and researchers in industry are encouraged to contribute presentations on either completed research or "work-in-progress" research.

Important Dates:

- March 19, 2007—Two-Page Paper Submission Deadline
- March 26, 2007—Paper Acceptance Notification
- March 30, 2007—Deadline for Advance Registration
- April 13, 2007—Presentation Submission Deadline
- April 20, 2007—Workshop

Attendees will receive the printed Proceedings and a CD-ROM of presentations. Workshop information can be found on the workshop's website: <http://www.ewh.ieee.org/r6/boise/wmed2007/WMED2007.htm> or contact Steve Groothuis, 2007 IEEE WMED General Chair at 208-363-4420 or skg-roothuis@micron.com.

~ **Sunit Tyagi, Editor**

ED South Brazil Chapters

-by J. W. Swart and Felipe L. Della Lucia

The ED South Brazil Chapter and the ED Student Chapter at UNICAMP invited Prof. Siegfried Selberherr, from the Technical University of Vienna, Austria, to give a seminar at the University of Campinas (UNICAMP), Brazil. The



Seminar attendees with Prof. Selberherr (center, with tie), after the lecture



Prof. Selberherr (right), giving his presentation to students from Brazil and Mexico

title of the seminar was "Strain Engineering for Nanoscale CMOS Transistors" and was held on February 8, 2007. The seminar attracted an attendance of 35 academics and students. Most of the attendance was from UNICAMP, others from the University of São Paulo and 15 of them were participants of a summer course going on at the Center for Semiconductor Components of UNICAMP.

This summer course is an hands-on laboratory on microfabrication, where the student fabricate and characterize MOS devices, among other activities. The 15 students attending this course come from different regions in Brazil and this year, two students from Puebla, Mexico, also attended. This heterogeneous audience of the seminar gave an interesting ambient, with rich discussions and a nice coffee break afterwards. Afterwards, Prof. Selberherr visited the Center for Semiconductor Components, with additional scientific discussions and discussions about the chapters.

~ **Jacobus W. Swart, Editor**

EUROPE, MIDDLE EAST & AFRICA (REGION 8)

ED Israel

- by Gady Golan

The chapter recently held three seminars at the Holon Inst. of Technology, Israel, with Professor Gady Golan, the ED Israel Chapter Chair, presiding.

December 27, 2006, Prof. Shelly Glaser, of the Holon Inst. of Technology (HIT), Israel, delivered his seminar on "True 3-D Displays: Lippman, Leith, Benton and Beyond" to around 85 attendees at the institute. The seminar presents the development of three dimensional auto-stereoscopic display technologies interlaced with several key discoveries in optical science: x-ray crystallography, holography, optical data storage and more. With the advent of advanced solid modelling ray tracing graphics and computational photography, this field is now seeing a revival with applications in engineering, industrial design, medicine and entertainment.

January 3, 2007, Dr. Ilan Ben David, Genoa Color, Israel, presented his talk on "MCP - the optimal colour solution for LCD TV" to around 135 attendees.

January 17, 2007, Dr. Avi Tourge-man, Intel Israel, gave a talk on "Lithography Masks for Displays - Manufacturing and Repair" to 50 people.

~ **Zhirun Hu, Editor**

Else Kooi Award

- by *Wouter Segeth*

The 9th annual workshop on Semiconductor Advances for Future Electronics (SAFE) was held in Veldhoven, the Netherlands 23-24 November 2006. There were sessions on Microsystems and packaging, processing and characterization and device technology. Invited speakers were Prof. Udo Schwalke who presented an outlook into epitaxial high-K dielectrics, Dr. Ruud Balkenende who talked about GaN laser diodes and Prof. Albert van den Berg, who discusses micro- and nano-fluidics for life sciences. In parallel, the 27th Workshop on Circuits Systems and Signal Processing, was organized with sessions on image processing, analog, mixed and RF signals as well as digital architecture. Both workshops are technically co-sponsored by the IEEE. Two joint sessions were held. In one of the sessions the Else Kooi Award was awarded to Dr. Ronald C.G. Naber of the Molecular Electronics-Physics of Organic Semiconductors group of the Rijksuniversiteit Groningen. The Else Kooi Award is named after the inventor of the LOCOS technology and is awarded for excellent research in the field of applied semiconductor research and IC-design.

ESREF 2006

- by *Ludwig Balk*

The decisive conference in Europe in the field of reliability testing of electronic circuits and for the development of new testing techniques, the "European Symposium on Reliability of Electron Devices, Failure Physics and Analysis" (ESREF) took place in Wuppertal from October 3-6, 2006, in the Historische Stadthalle (Historical City Hall) on the Johannisberg in Wupper-



Impression of one of the poster sessions from ESREF 2006

tal-Elberfeld. Three hundred experts from science and industry attended the four-day conference with a focus on microelectronic devices as well as power devices, e.g. for hybrid vehicles, and optoelectronic devices.

ESREF is part of an international network, as utmost attention has to be given to the topic of failure analysis of electronic components both because of scientific and economic reasons. Scientifically the analysis of structures and the diagnosis of the mode of operation of electronic devices have meanwhile come up against their limitations which is due to the ever rising performance data of the devices, the ever rising integration and the constantly decreasing size of the components.

Against this technological background the economic aspect of this development comes into focus: The costs for product testing have risen enormously and will continue to rise. Furthermore product testing has already been carried out at the development stage, then during production and later for the devices returned by the customers.

Within the framework of the conference, several workshops about special topics were organized: the workshop on "Focused Ion Beam" counted more than 100 participants.

ISLPED 2006

- by *Mircea Stan*

The International Symposium on Low Power Electronics and Design (ISLPED) is the premier forum for presentation of advances in all aspects of low power design and technologies, ranging from process and circuit technologies, to simulation and synthesis tools, to system level design and optimization. ISLPED 2006 was held October 4-6, in

Rottach-Egern, Germany. The Symposium featured a three-day technical program that also included two keynote, Christoph Kutter (Infineon) and Barry Dennington (NXP), four embedded tutorials, a panel, a design contest and a half-day tutorial.

The ISLPED 2006 best paper awards, chosen from all technical submissions, are: "Analysis of Super Cut-off Transistors for Ultralow Power Digital Logic Circuits" by A. Raychowdhury, X. Fong, Q. Chen and K. Roy, Purdue U., Lafayette, IN, USA, for the "Architecture, Circuits, and Technology" track, and "Temporal Vision-Guided Energy Minimization for Portable Displays" by W. Cheng, C. Hsu and C. Chao, National Chiao-Tong U., Hsin-Chu, Taiwan, for the "Design Tools, System and Software Design" track.

In 2007, ISLPED will return to the USA (Portland, OR) and to its traditional July-August timeframe. ISLPED is sponsored by IEEE CASS and ACM SIGDA, with technical support from IEEE SSCS and IEEE EDS. For timely updates and Call for Papers, please check: www.islped.org.

~ **Cora Salm, Editor**

ASIA & PACIFIC (REGION 10)

ED Japan

- by *Atsushi Kurobe*

A DL talk entitled, "Improvement of characteristics of deep sub-micron CMOS devices with halo implantation and high-k dielectric", was given by Prof. Chandan K. Sarkar of Jadavpur University, Calcutta, India, at the Suzukakedai Campus of Tokyo Institute of Technology, Yokohama, Japan, on November 28, 2006. The talk was followed by a lively discussion on the suppression of the short-channel effects and the potential of high-k materials between the lecturer and the audience. This DL meeting, attended by 15 people was very meaningful.

On December 20, 2006, a DL meeting was held at New Industry Creation Hatchery Center, Tohoku University, Sendai. Prof. Herzl Aharoni of Ben-Gurion University of the Negev, Israel, lectured on recent



The DL meeting on November 28, 2006, with invited speakers (3rd and 4th from left), Prof. Hiroshi Iwai, Partner and EDS Jr. Past President and Prof. Chandan K. Sarkar, Jadavpur University, India

interesting technologies. The title of the lecture was "Two terminal and multi-terminal efficient planar silicon light emitting devices (Si-LED's) fabricated by standard IC technology as components for all-silicon monolithic integrated optoelectronic systems." The presentation offered an opportunity to get to grips with up-to-date, interesting and useful research. The meeting, with more than 30 participants, was a great success.

In addition, in the latter half of the year from July 2006 to December 2006, the ED Japan Chapter held 6 joint technical meetings with the Japan Society of Applied Physics, the Institute of Electronics, Information and Communication Engineers, etc.

ED Kansai

- by Michinori Nishihara

The 6th Kansai Colloquium Electron Devices Workshop was successfully held at the Osaka University Nakanoshima Center, Osaka, Japan, on October 18, 2006, with 33 participants. The Workshop, sponsored by the ED Kansai Chapter and the Graduate School of Engineering, Osaka University, offered a good opportunity

for students and researchers in the Kansai area to get in touch with up-to-date world-class research and development activities.

Eleven papers regarding silicon and compound semiconductor devices as well as emerging technologies were selected for the presentation. The Award Committee selected two papers for the 6th MFSK (Message From Spirited Kansai) Award. The winners were Dr. Masaki Iijima for his paper titled, "Active Body-Biasing Control Technique for Bootstrap Pass-Transistor Logic on PD-SOI at 0.5V-VDD" and Dr. Prakaipetch Panchaipetch for, "Study of Factors Effecting Electron Tunneling Mechanism in Si Nanocrystals Floating Gate Memories."

During the Workshop, the 'Chapter of the Year Award' was announced. The winner was Dr. Masahiro Yoneda for his paper titled, "Fluorine Incorporation into HfSiON Dielectric for Vth Control and Its Impact on Reliability for Poly-Si Gate pFET." All winners were honored with a memorial wall plaque engraved with their names.

ED/SSC Seoul

- by Chulwoo Kim

In 2006, the IEEE Seoul Chapter host-



The winners of the 6th MFSK Award and "The Chapter of the Year" at the 6th Kansai Colloquium Electron Devices Workshop, October 18, 2006, Osaka, Japan



From Left: Prof. Chulwoo Kim, Prof. Suki Kim, Prof. Sung-Mo Kang, Prof. Sangsig Kim, Prof. Cheol Jin Lee, and Prof. Jinyong Chung



From Left: Vice President Jeong-Taek Kong, Prof. Jin-Ku Kang, Prof. Kwang Sub Yoon, Prof. Shin-Il Lim, Prof. Massoud Pedram, Mr. Sung-Hoon Bae, Prof. Hong-June Park, Mr. Young-Wook Yu and Prof. Chulwoo Kim

ed two lectures by Distinguished Lecturers; the first one by Prof. Steve Kang, University of California, Santa Cruz. He presented an interesting paper entitled, "Bioelectronics, Its Status and Prospectus," at Korea University, August 23, 2006. In this talk, the current status of biomimetic microelectronic systems, laboratory-on-a-chip (LoC), and energy scavenging for implantable devices were discussed with development of CAD models and simulation tools for biological circuits, biomimetic systems, and their hybrid structures. About 100 people attended the seminar. The distinguished lecture was followed by a chapter meeting during dinner to give the chapter members a chance to get together with the distinguished lecturers and to have close conversations on selected topics.

Prof. Massoud Pedram, University of Southern California, presented the second talk entitled, "Charge-recycling MTCMOS: Circuit Techniques and Design Automation Algorithms," at COEX, Seoul, on October 26, 2006, with about 25 people attending that seminar. He addressed a charge recycling MTCMOS technique that cuts the energy consumption for mode transitions in half while preserving the wakeup delay and reducing the ground bounce level in the target circuit. A chapter meeting was held with chapter members, after his presentation. Prof. Pedram gave several good tips to improve chapter activities, such as DL seminars, homepage management, organizing international conferences, etc.

~ Kazuo Tsutsui, Editor

ED Taipei

- by Steve Chung

For the last quarter of 2006, the ED Taipei Chapter held 3 seminar events with 4 invited speakers and one DL speaker.

On December 6, an invited talk entitled, "Recent Progress in Global Thin Film Photovoltaic Technology", was given by Professor-Emeritus Sheng Li from the University of Florida. In this talk, he addressed the importance of solar energy related issues nowadays. He also mentioned that during his early stage of research in the 70's, his work was focused on solar cell research and now that he has retired he has come back to study on the semiconductor solar cell again. This talk was attended by 50 participants including professors and Ph.D. students.

On December 18, an invited speaker from Intel, Dr. Suman Datta, gave a DL talk on "Ultra Low Power Nanoelectronics for the Logic technology". In this talk, he addressed the more recent interests on the CMOS logic development with emphasis on strained technology, metal gate/high-k gate stack, studies of high-k as gate insulator for III-V compound devices, and several new materials and non-silicon devices. More than 60 graduate students from the university and Science Park engineers attended.

On December 22, the last talk of the year was a special seminar on high speed semiconductor devices, in which 2 invited speakers, and a DL, gave presentations on the following three topics:

- (1) InP Vertical Heterostructure Transistors (DL, Professor Y. Miyamoto, Tokyo Institute of Technology),
- (2) Future Prospect of III-Nitride Heterojunction FETs (Prof. M. Kuzuhara, University of Fukui), and
- (3) Recent technology of III-V Compound Semiconductor Materials for High Frequency Devices (Dr. Y. Otaki, Hitachi Cable). This is a joint seminar organized by the Chapter and the Department of Material Science, NCTU. More than 60 attended.

One of the largest conferences in Taiwan is the IEEE EDS sponsored International Symposium on VLSI Technology, Systems, and Applications (VLSI-TSA), which will be held April 23-25, 2007, in the Ambassador Hotel near Science-Based Industrial Park, Hsinchu, where most of the IC manufacturing and design companies are located. The program consists of two-and-half days of paper presentations and a half-day of short courses. For registration details, please visit the conference website at <http://vlsitsa.itri.org.tw/2007>.

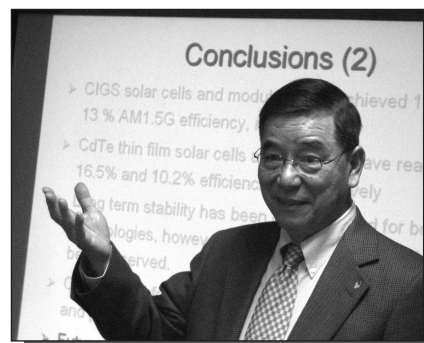
~ Hei Wong, Editor

ED/SSC Bangalore

- by P.R. Suresh

The chapter conducted the following events for the 4th quarter of 2006.

Prof. Krishna Shenai, Utah State University, delivered a DL on "Power Management of Microchips and Handheld OEM Devices on Scaling" on October 13. About 30 people attended this program. This talk



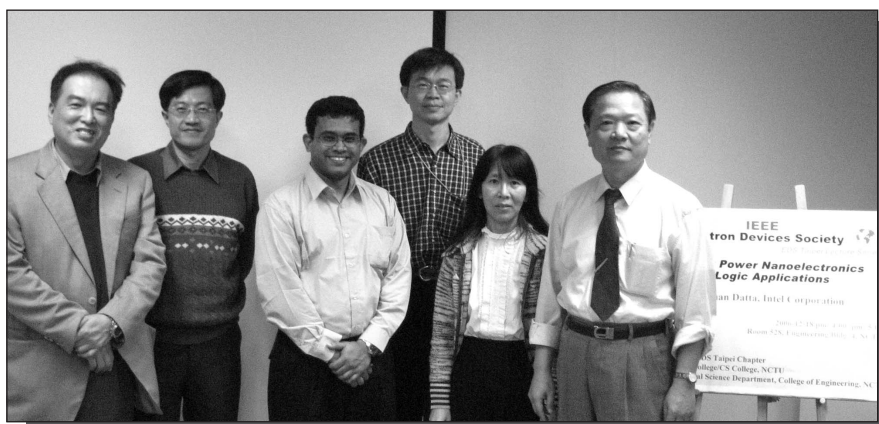
Prof. Sheng Li, invited speaker, giving his talk on December 6, at the ED Taipei Chapter

focused on new strategies and directions for the development and application of advanced low-power mixed-signal and RF electronics, especially to fuel next generation multimedia and wireless devices with embedded power management technologies.

A seminar on "Challenges in Advanced Technologies and Enablement" was given by David Hareme, IBM Semiconductor Research and Development Center, on October 19. The talk focused on the challenges on RF/AMS technologies in RFCMOS and SiGe BiCMOS technologies. Also, some key attributes of advanced models and design kits was discussed. This talk was attended by about 40 people.

A seminar on "Analog/Mixed signal layout: Methodology, Challenges and future" was given by Dan Clein, PMC Sierra Inc, on November 8. The talk focused on the challenges on RF/AMS technologies in RFCMOS and SiGe BiCMOS technologies. This talk brought out challenges in analog/mixed-signal layout now and in the future with relevance of tools and methodology and was attended by about 100 people.

The chapter organized a mini colloquium on November 11, 2006, with special financial support from IEEE EDS. Two eminent researchers in the Electron Devices area presented talks on technologically interesting and academically stimulating topics, with a total presentation time of four hours. The first talk was by Prof. S. Cristoloveanu, IMEP, Grenoble, France, entitled, "From Micro- to Nano-Electronics Using SOI Technology: Advanced Materials, Devices



ED Taipei Chapter members and speaker at the December 18 presentation: (From left) Ed Chang, T.S. Chao, Suman Datta (speaker), C.H. Chien, J.C. Guo, Steve Chung (ED Taipei Chapter Chair)

and Concepts." One hour of introduction to SOI in general was followed by the current state of the art, technological problems, and novel device ideas based on SOI technology. Prof. Cristoloveanu discussed why SOI is not merely an alternative to bulk CMOS today, but a leading competitor. The second talk was by Prof. E. Sangiorgi, University of Bologna, Italy. The topic of this talk was "Modeling decanometer MOSFETs: challenges and perspectives." Prof. Sangiorgi spent one hour on introduction to Monte Carlo simulation for semiconductor devices and then presented the latest results on a variety of devices. He explained why Monte Carlo analysis is the only practical way of getting a quantitative idea of device behavior in many cases of technological interest, such as FLASH devices. The response for the mini colloquium was very enthusiastic, with about 45 participants from industry and academia attending the event.

The chapter will be organizing the 14th International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA 2007) in July 2007 at Bangalore. Several of the chapter members are working hard to make this conference a success.

ED Bangladesh

- by Anisul Haque

An election of the Executive Committee of the EDS Bangladesh Chapter for 2007, was held on November 28, 2006. The following committee members were unanimously elected:

- a. **Chapter Chair:** Prof. Anisul Haque, East West University, Dhaka
- b. **Chapter Vice Chair:** Prof. Md. Quamrul Huda, BUET, Dhaka
- c. **Chapter Secretary & Treasurer:** Prof. A.B.M. Harun-Ur Rashid, BUET, Dhaka.

The inaugural ceremony of the ED Bangladesh Chapter was held on December 19, 2006, at the East West University auditorium in Dhaka. Prof. Hiroshi Iwai, Tokyo Institute of Technology, declared the Chapter open as the Chief Guest. Prof. M. Ataul Karim, Vice President, Old Dominion University, USA, was also present at the occasion as the Special Guest. Prof.

Iwai gave a technical presentation on Electronic Devices for Human Society after the inaugural. The program was attended by more than 100 students, faculty members, ED Bangladesh members and IEEE Bangladesh Section members.

AP/ED Bombay

- by Mahesh Patil

A mini colloquium was organized by the AP/ED Bombay Chapter on Friday, November 10, 2006. The colloquium included two technical talks. The first by Prof. S. Cristoloveanu, IMEP, Grenoble, was entitled, "From Micro to Nano-Electronics Using SOI Technology: Advanced Materials, Devices and Concepts." One hour of introduction to SOI in general was followed by the current state of the art, technological problems, and novel device ideas based on SOI technology.

The second talk given by Prof. E. Sangiorgi, University of Bologna, Italy, was on the topic of "Modeling decanometer MOSFETs: challenges and perspectives." Prof. Sangiorgi spent one hour on introduction to Monte Carlo simulation for semiconductor devices and then presented

the latest results on a variety of novel devices.

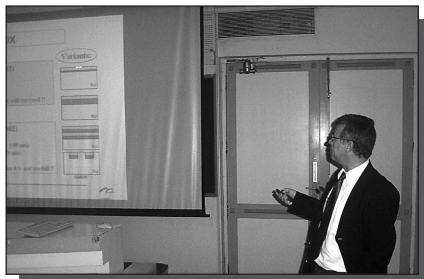
ED/MTT India

- by Kandala Chari

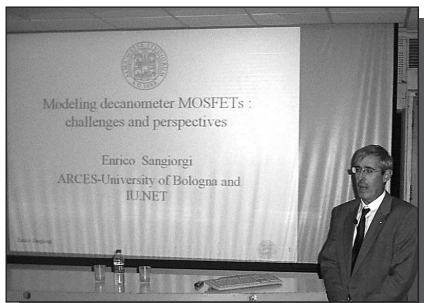
The Chapter in active association with Muthayammal Engineering College, organized a one day National Festive of Science and Engineering Schools (NFSES-2006) at MEC Campus, Rasipuram, Tamil Nadu. Over 300 entries were received; and 50 presented their works. Cash Awards for original concepts/themes were given by the Chapter and prizes were won by entries from Janakiammal Engineering College, Coimbatore, Vellalar College of Engg and Technology, Hindusthan College of Engineering, Coimbatore, and Kongu Engineering College, Perudurai. All participants were given certificates on behalf of the Chapter and MEC Rasipuram. The Chapter Chair addressed the 220 participants, underlining the need for innovative solutions. Dr. M. Madheswaran, Principal, coordinated the event from the MEC side. Mr. Ramasamy, Chairman, Mr. R. Muthuvel, Director, and Mr. K. Gunasekaran, ED of MEC, supported the initiative with major finances.

Two National seminars co-sponsored by the Chapter and supported by the IEEE MTT Society Technical Committees' Speakers Bureau, were held at the University of Jaipur and IIT Mumbai on 4 and 6 October. Prof. K. C. Gupta, Past President MTT-S and DL, delivered seminars on "Applications of Artificial Neural Networks to Microwave Design" and "Web-Based Education". Prof. D. Bhatnagar, University Rajasthan, and Prof. Girish Kumar, IIT Mumbai, organized the events at their respective sites. These events were attended by over 150 students and faculty and appreciated for the contents.

The Chapter co-sponsored the 3 day National Conference on "Recent Advancements in Microwave Technique and Applications" (Microwave-2006) held at Jaipur during 6-8 October 2006. The conference had 21 sessions, including two plenary talks and one tutorial session. Twenty-five (25) invited talks were delivered by eminent speakers including Prof. K.C. Gupta (USA), Dr. H. P. Vyas (SSPL),



Prof. S. Cristoloveanu giving a talk on SOI technology at the mini colloquium on November 10, 2006 at IIT Bombay



Prof. E. Sangiorgi speaking on Advanced computational methods for decanometer MOS transistor simulation



Inauguration of NFES-2006 at MEC, Rasipuram



Delegates attending NWES-RF ID at SASTRA, Thanjavur

Dr. S. Pal and Dr. S.B. Sharma (ISRO), Prof. S. K. Kaul (IIT, New Delhi), and Prof. V. Sinha (LNMIIT). A total of 149 entries were received for oral and poster presentations and more than 300 delegates attended. Thirteen companies/institutions associated with microwave electronics, also participated. The event was coordinated by Dr. D.. Bhatnagar from the University of Rajasthan and Prof. Sancheti from MNIT.

TIFAC-CORE, SASTRA University and the Chapter, jointly organized a 3 day National Seminar on Embedded Systems (NSES) with RFID theme during 26-28 October 2006. The event featured over 10 technical talks and a visit to VLSI and Embedded System Laboratories at SASTRA. Speakers included: Mr. Venkat Rajaraman, Portal Player India; Ms. Manimekhala, TCE Madurai; Dr. N.K. Sakthivel and Mr. Abid Ali Khan of SASTRA; Mr. Irshad Rasheed, Perspecte Solutions,

Chennai; Dr. K.S. Chari, DIT Delhi; Mr. Rangarajan, TCS Chennai, etc., as well as a Panel consisting of Dr. K.S. Chari, Mr. Rangarajan and Dr. Thiagarajan. One hundred (100) faculty members, industry and students from various engineering colleges attended. The proceedings of the seminar were brought in CD. Prof. Usha Devi and Mr. Saravanan of SASTRA coordinated the event from SASTRA.

In association with Kruksheeta Electronics Society, the Chapter organized a screening of 2 EDS Video tapes: Circuit Designs and Technology for RF CMOS and Giga Scale CMOS Technology during 2-3 November 2006. Over 100 students attended and took benefit of the advanced exposures. Prof. P. J. George coordinated the event from the KU side.

REL/CPMT/ED Singapore

- by Wilson Tan

The Chapter had the following activities during the 4th quarter of 2006:

Short Course -

- 6 November 2006, "Thermal Test Methods for Integrated Circuits" by Bernie Siegal, Thermal Engineering Associates Inc, USA.

Distinguished Lectures -

- 2 August 2006, "Post-breakdown Conduction in Ultra-thin Gate Oxides: From Physical Models to Circuit Applications", Prof. Enrique Miranda, Electronics Engineering from the Universitat Autònoma de Barcelona (UAB), Spain.
- 7 November 2006, "Key Differences between EU RoHS and China RoHS", Dr. John Lau, ASME Fellow, IEEE Fellow.



Hiroshi Iwai visiting Singapore Chapter



EPTC 2006 Conference Social/Banquet Event at the Malay Heritage Centre

Technical Talks -

- 28 August 2006, "Advanced Gate Stack for Nano Silicon Devices", Dr. Yu Hong Yu, IMEC, Belgium.
- 21 December 2006, "Probing Plasticity at the Nano Scales: From Size Effects Uniaxially-Compressed Au Nanopillars to Plasticity-Modulated Electromigration in 65nm Cu Interconnects", Dr. Arief S. Budiman, Stanford University, USA.

Conferences and Other Activities - EPTC 2006

The 8th Electronics Packaging Technology Conference (EPTC 2006) was held on 6-8th December 2006 at the Pan Pacific Hotel, Singapore. This conference is organized by the Reliability/CPMT/ED Singapore Chapter of the IEEE Singapore Section. EPTC 2006 is sponsored by IEEE CPMT Society and technically co-sponsored by IMAPS.

Educational Activities for Students

The Chapter donated a sum of \$400 USD for one student activity organized by the Student Chapter of the National University of Singapore (NUS) Branch. The Macromedia Flash Course and Flash Presentation Competition was organized by the NUS Student branch on 19-20 & 23 October.

EDS 2006 Chapter of the Year Award

Xing Zhou (EDS AdCom member) represented the REL/CPMT/ED Singapore Chapter to receive the EDS 2006 Chapter of the Year Award on behalf of Chapter Chair Wilson Tan during the 2006 IEDM held in San Francisco in December 2006.

Reliability Society 2005 Chapter of the Year Award

Our Chapter also recently won the Reliability Society 2005 Chapter of the Year Award, as announced on 23 August 2006, and ranked ahead of Dallas Chapter (2nd) and Boston Chapter (3rd).

Meetings

Dr. Alastair Trigg represented IPFA 2006 as General Chair & the IPFA Board to attend the ISTFA'06 conference/meeting held on 12-16 November 2006 in Texas, USA.

Prof. Hiroshi Iwai, Chapter partner, met with chapter secretary Dr. Kin-Leong Pey and committee member Dr. Xing Zhou on 3 December 2006, during his trip to Singapore and discussed EDS and chapter activities.

New Appointments

Chapter committee member Xing Zhou has been elected as EDS AdCom member for the 2nd term. He has been appointed as Chair for SRC-AP, as well as Ex-Officio AdCom member for the EDS Publications Committee and the EDS Educational Activities Committee.

ED SJCE Student Branch

- by P.M. Pavan

Working successfully on the fast track, the chapter has again organized a series of events with guidance from Dr. Navakanta Bhat, Prof. IISc, Bangalore (Chapter Mentor) and Dr. C.R. Venugopal, Prof., Dept. of Electronics and Communication, (Chapter Counselor) SJCE, Mysore.

To start, weekly tests and quizzes were conducted on Basic Electronics to refresh and review the designing skills of the students and generate some hands on practical exposure.

The test was comprised of various questions on Basic Electronics, Signals and Systems, Logic Families, Network Analysis and Digital Signal Processing. This test is especially for the students of Hardware branches, which can be called as a step towards technical excellence.

This quarter the chapter was focused more on conducting workshops which provided the platform for the students to establish their hold on extra curricular subjects other than what usually is taught in their course.

EDS-SJCE is conducting a course on Number Theory and Cryptography by Dr. C.S.Yogananda, Head of Dept., Mathematics, SJCE, a distinguished personality in the field of Mathematics. He has been active in Mathematics Olympiad Cell, IISc, Bangalore. Around 50 students are involved in the course which is aiming towards encryption standards. The course module consists of Primality, Factorization, Congruency, their properties and application which all lead to a strong basis in the field of Cryptography.

A one day Workshop on Wavelets by Dr. Ashok Rao, Former head, CEDT (Centre for Electronics Design and Technology) was held on 29 October 2006. It started off with the basics of signals touching upon the Fourier Transforms, its properties applications and limitations and proceeded with a very smooth transition towards the topic. It was a very interactive session in which the students were made to work on a few of the topics. The workshop provided the students a good knowledge about the subject as well as its applications.

The post session of the workshop dealt with the professor enlightening the students on how a project should be. He gave the students a brief idea on the project topics, the way a project should be undertaken and what it takes to make a good project.

"When the going gets tough, the tough gets going" being the motive of the IEEE-EDS SJCE subchapter, it has well proved that it is a very good platform for the students to improve their technical base and it will continue doing so in the coming future.

~Xing Zhou, Editor



Inquisitive students listening to the lecture



At the centre: Dr. Ashok Rao along with the students who attended the workshop

EDS MEETINGS CALENDAR

(AS OF MARCH 14, 2007)

THE COMPLETE EDS CALENDAR CAN BE FOUND AT OUR WEB SITE:
[HTTP://WWW.IEEE.ORG/SOCIETY/EDS/MEETINGS/MEETINGS_CALEDAR.XML](http://www.ieee.org/society/eds/meetings/meetings_calendar.xml) PLEASE VISIT!

April 30 - May 2, 2007, T **IEEE Sarnoff Symposium on Advances in Wired and Wireless Communications** Location: Nassau Inn, Princeton, NJ, USA, Contact: Gerhard Franz, E-Mail: sarnoff2005@agfranz.com, Deadline: 12/4/06, www: <http://www.sarnoffsymposium.org>

May 7 - 10, 2007, T **International Conference on Memory Technology and Design** Location: Village Vacances Familles (VVF) "La Badine", Hyeres Les Palmiers, France, Contact: Liesbet Massant, E-Mail: massant@imec.be, Deadline: 2/4/07, www: <http://www.icmt.d.com>

May 14 - 18, 2007, @ **International Conference on Indium Phosphide and Related Materials**, Location: Kunibiki Messe, Matsue, Japan, Contact: Shigehisa Arai, E-Mail: arai@pe.titech.ac.jp, Deadline: 2/2/07, www: <http://www.iprm.jp/index.html>

May 14 - 16, 2007, T **Colloquium on Microwave Communications** Location: Hunguest Hotels Europa Congress Center Budapest, Budapest, Hungary, Contact: Tibor Berceli, E-Mail: tibor.berceli@mht.bme.hu, Deadline: 2/5/07, www: www.diamond-congress.hu/mow2007

May 14 - 16, 2007, T **Mediterranean Microwave Symposium** Location: Hunguest Hotels Europa Congress Center Budapest, Budapest, Hungary, Contact: Tibor Berceli, E-Mail: tibor.berceli@mht.bme.hu, Deadline: 1/20/07, www: www.diamond-congress.hu/mow2007

May 14 - 17, 2007, T **International Electrostatic Discharge Workshop** Location: Stanford Sierra Conference Center, South Lake Tahoe, CA, USA, Contact: Lisa Pimpinella, E-Mail: info@esda.org, Deadline: 11/17/06, www: www.esda.org/iew.htm

May 15 - 17, 2007, @ **IEEE International Vacuum Electronics Conference** Location: Kitakyushu International Conference Center, Kitakyushu, Japan, Contact: Yoshie Moriguchi, E-Mail: ivec2007@ics-inc.co.jp, Deadline: 1/12/07, www: <http://www.ivec2007.org>

May 15 - 20, 2007, T **IEEE Semiconducting and Insulating Materials Conference** Location: University of Arkansas, Fayetteville, AK, USA, Contact: Zhiming Wang, E-Mail: zmwang@uark.edu, Deadline: 2/15/07, www: <http://www.ibiblio.org/simc>

May 15 - 16, 2007, T **Workshop on Ultimate Integration of Silicon Devices** Location: NXP Research/IMEC, Leuven, Belgium, Contact: Youri Ponomarev, E-Mail: youri.ponomarev@nxp.com, Deadline: 1/26/07, www: www.ulisconference.org

May 23 - 26, 2007, T **International Conference on Perspective Technologies and Methods in MEMS Design** Location: Lviv Polytechnic National University, Lviv, Ukraine, Contact: Mykola Pereyma, E-Mail: memstech@polynet.lviv.ua, Deadline: 2/1/07, www: <http://www.lp.edu.ua/Institute/IKN/CAD/MEMSTECH>

May 28 - 31, 2007, @ **IEEE International Symposium on Power Semiconductor Devices & Integrated Circuits** Location: Ramada Plaza Jeju Hotel, Jeju Island, South Korea, Contact: Min-Koo Han, E-Mail: mkh@snu.ac.kr, Deadline: 11/16/06, www: <http://www.ispsd07.org>

May 29 - June 1, 2007, T **International Conference on Electron, Ion and Photon Beam Technology and Nanofabrication** Location: Adam's Mark Hotel, Denver, CO, USA, Contact: J. Liddle, E-Mail: jalEIPBN2007@comcast.net, Deadline: 1/12/07, www: www.eipbn.org

June 3 - 5, 2007, T **IEEE Radio Frequency Integrated Circuits Symposium** Location: Hawaii Convention Center, Honolulu, HI, USA, Contact: Luciano Boglione, E-Mail: l.boglione@ieee.org, Deadline: 1/8/07, www: <http://www.rfic2007.org>

June 4 - 4, 2007, T **IEEE International Workshop on Electron Devices and Semiconductor Technology** Location: Tsinghua University, Beijing, China, Contact: Tian-Ling Ren, E-Mail: RenTL@tsinghua.edu.cn, Deadline: Not Available, www: <http://www.ime.tsinghua.edu.cn/EDST2007>

June 5 - 7, 2007, * **IEEE International Interconnect Technology Conference** Location: Hyatt Regency at San Francisco Airport, Burlingame, CA, USA, Contact: Wendy Walker, E-Mail: wendyw@widerkehr.com, Deadline: 1/19/07, www: <http://www.his.com/~iitc/>

June 7 - 10, 2007, T **International Image Sensor Workshop** Location: the Cliff House Resort & Spa, Ogunquit, ME, USA, Contact: Bedabrata Pain, E-Mail: bpain@jpl.nasa.gov, Deadline: 2/23/07, www: www.imagesensors.org

June 8 - 9, 2007, T **International Workshop on Junction Technology** Location: Kyoto University Clock Tower Centennial Hall, Kyoto, Japan, Contact: Kazuo Tsutsui, E-Mail: ktsutsui@ai.titech.ac.jp, Deadline: 3/2/07, www: <http://www.iwailab.ep.titech.ac.jp/IWJT/>

June 10 - 14, 2007, @ **TRANSDUCERS - International Conference on Solid-State Sensors, Actuators and Microsystems** Location: Cite Centre Des Congres, Lyon, France, Contact: Thomas Garmier, E-Mail: info@transducers07.org, Deadline: 12/1/06 www: www.transducers07.org

June 10 - 11, 2007, @ **Silicon Nanoelectronics Workshop** Location: Rihga Royal Hotel, Kyoto, Japan, Contact: Hiroshi Mizuta, E-Mail: mizuta@pe.titech.ac.jp, Deadline: 2/15/07, www: <http://diana.pe.titech.ac.jp/~snw/>

June 11 - 12, 2007, * **IEEE/SEMI Advanced Semiconductor Manufacturing Conference** Location: Grand Hotel Bristol, Stresa, Italy, Contact: Margaret Kindling, E-Mail: mkindling@semi.org, Deadline: 10/19/06, www: <http://www.semi.org/asmc>

June 12 - 15, 2007, @ **IEEE Symposium on VLSI Technology** Location: Rihga Royal Hotel, Kyoto, Japan, Contact: Phyllis Mahoney, E-Mail: phyllism@widerkehr.com, Deadline: 1/10/07, www: <http://www.vlssymposium.org>

June 18 - 20, 2007, T **Device Research Conference** Location: University of Notre Dame, South Bend, IN, USA, Contact: Berinder (Bobby) Brar, E-Mail: bbrar@teledyne.com, Deadline: 3/9/07, www: www.device-research-conference.org

EDS ALL INDIA CHAPTERS MEETING

The 4th EDS All India Chapters Meeting – joint meeting of Chapter Chairs and representatives from the EDS Chapters in India and Chapter Partners – was held at Bangalore on 6 January 2007, in conjunction with the 20th IEEE VLSI Design Conference. The meeting was hosted by the ED/SSC Bangalore Chapter. All the EDS chapters in India were represented at the meeting. EDS President-Elect, Cor Claeys, was the guest of honor, and he described various activities and future plans EDS envisages, especially in the region, and congratulated the chapters for the excellent performance in yester years.

The status of various EDS activities by the chapters were reviewed. All the chapters had a very active year in 2006 and some of the joint activities were excellent to reach out to the members. Both Bombay and Bangalore chapters jointly organized a DL mini-colloquia by having the activity on adjacent days at both places. The Calcutta Chapter organized many activities at various locations in the north-east region of India as per their out-reach

program. The SJCE Student Chapter at Mysore, which has a healthy member strength of more than 70 EDS stu-



From left: Partha Sarkar (EDS, Calcutta), C. Sarkar (EDS, Calcutta), Sankara Reddy (EDS, Bangalore), Cor Claeys (EDS President-Elect), S.D. Gupta (EDS, Bombay), M.K. Radhakrishnan (Chapter Partner), C.R. Venugopal (EDS Mysore-SJCE) and P.R. Suresh (EDS, Bangalore)

dent members, was commended at the meeting for organizing various activities regularly with a weekly frequency. More joint activities including out-reach programs are planned for the coming years. These include a WIMNACT program in 2007 at different locations, for which approval will be sought from HQ. The Bangalore

Chapter is organizing the 14th IEEE International Symposium on the Physical and Failure Analysis and Reliability of Integrated Circuits (IPFA), in July 2007, in cooperation with the Bombay Chapter. The IPFA is also technically co-sponsored by EDS. As the electron device related activities, especially design, are booming in many cities in India and the individual EDS membership is also growing, it was felt that there is a need for new chapters to better serve this growing community. The activities for new Chapters at Chennai, Hyderabad, Pune and Delhi have been initiated and these could be joint chapters. Other potential locations for new Chapters were identified as Bhubaneswar, Noida and Kanpur. The Chapter Partners will work with different groups in all these locations to explore the possibilities and to initiate chapters.

*M.K. Radhakrishnan
EDS Regions/Chapters
Committee Member
Nanorel
Bangalore, India*