IEEE
ELECTRON DEVICES SOCIETY
Newsletter

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SAVE THE DATES! Don't Miss the IEDM and EDS BoG Meeting December 7–11, 2013

The next EDS Board of Governors (BoG) Meeting is scheduled for December 7–8, in Washington, D.C., and held in conjunction with the 2013 IEEE International Electron Devices Meeting (IEDM).

The activities of the Electron Devices Society are governed by a Constitution and Bylaws and administered by a Board of Governors (BoG) consisting of 4 officers, 22 elected members-at-large and about 550 'ex-officio' members.

EDS members are encouraged to become involved with the activities of the Society and its BoG. The Board of Governors includes: Standing Committees, Technical Committees, Publication representative positions and IEEE representative positions. If you are interested in participating in EDS activities or being considered for a BoG position, please contact Chris Jannuzzi (c.jannuzzi@ieee.org), at the EDS Executive Office.

2013 IEEE International Electron Devices Meeting (IEDM)

59TH ANNUAL IEDM RETURNS TO WASHINGTON, D.C. DECEMBER 9–11

DESTINATION D.C.

Washington Monument and U.S. Capitol

Special focus sessions: bioMEMS, analog devices and circuits, advanced semiconductor manufacturing, and terahertz devices.

The Electron Devices Society's annual technical conference, the IEEE International Electron Devices Meeting, will host the world's leading microelectronics scientists and engineers from industry, academia and government this coming December in Washington, D.C. There they will enjoy a technical program of more than 200 presentations along with thought-provoking plenary talks, panel discussions, special sessions, short courses, IEEE/EDS award presentations and other events spotlighting more leading work in more areas of the field than at any other conference.

The 2013 IEDM will take place at the Washington Hilton Hotel December 9–11, 2013, preceded by a full day of short courses on

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Your Comments Solicited

Your comments are most welcome. Please write directly to the Editor-in-Chief of the Newsletter at radhakrishnan@ieee.org

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ELECTRON DEVICES SOCIETY

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EDS Board of Governors (BoG)
Elected Members-at-Large

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

2013	Term	2014	Term	2015	Term
A. Escobosa	(1)	Z. Celik-Butler	(1)	Daniel Camacho	(1)
J. J. Liou	(1)	M. Chan	(1)	Subramanian S. Iyer	(2)
M. Ostling	(1)	S. Chung	(1)	Meyya Meyyappan	(2)
M.K. Radhakrishnan	(1)	S. Deleonibus	(2)	Arokia Nathan	(2)
R. M. Todi	(2)	F. Guarin	(2)	Michael Shur	(2)
A. Z.H. Wang	(1)	T.L. Ren	(1)	Doug Verret	(1)
X. Zhou	(1)	S. Saha	(2)	Bin Zhao	(2)
		E. Sangiorgi	(1)		

NEWSLETTER EDITORIAL STAFF

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 http://eds.ieee.org/eds-newsletters.html. The archive contains issues from July 1994 to the present.

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Upcoming Technical Meetings

2013 IEEE Semiconductor Interface Specialists Conference (SISC)

WASHINGTON, DC, ATTRACTIONS ARE WITHIN EASY REACH FROM THE KEY BRIDGE MARRIOTT HOTEL IN ARLINGTON, VIRGINIA

The 44th IEEE Semiconductor Interface Specialists Conference (SISC) will be held December 5–7, 2013, at the Key Bridge Marriott Hotel in Arlington, Virginia, immediately prior to the IEEE International Electron Devices Meeting (IEDM). An evening Tutorial session, free to all registered SISC attendees, will be held on December 4th.

The SISC is a workshop-style conference that provides a unique forum for device engineers, materials scientists, and solid-state physicists, to openly discuss issues of common interest. Principal topics are semiconductor/insulator interfaces, the physics of insulating thin films, and the interaction among materials science, device physics, and state-of-the-art technology. Emphasis is placed on current and future nano-scale device architectures, and how interfaces between dissimilar materials and ultra-thin films affect device operation where theory, modeling/simulation, and characterization results are used to help understand the impact on device performance and reliability. The conference alternates between the East and West Coasts, and meets just before the IEDM to encourage the participation of IEDM attendees. SISC is sponsored by the IEEE Electron Devices Society.

An important goal of the conference is to provide an environment that encourages interplay between scientific and technological issues. Oral sessions of invited and contributed talks, as well as a lively poster session, are designed to encourage discussion. Conference participants have numerous opportunities for social gatherings with renowned scientists and engineers. They also enjoy Washington, DC attractions such as the National Mall with the Lincoln Memorial, the National Air and Space Museum, the National Gallery of Art, the White House, the U.S. Capitol, and the Library of Congress.

Conference Focus

The program includes about 70 presentations from all areas of MOS science and technology. The topics evolve with the state-of-the-art, and include:

- **SiO_2** and **high-k dielectrics** on Si and their interfaces
- **Insulators on high-mobility and alternative substrates** (SiGe, Ge, III-V, SiC, etc.)
- MOS gate stacks with **metal gate electrodes**
- Stacked dielectrics for **non-volatile memory**
- **Oxide and interface structure**, chemistry, defects, and passivation: Theory and experiment
- **Electrical characterization, performance and reliability** of MOS-based devices
- **Surface cleaning technology** and impact on dielectrics and interfaces
- Dielectrics on **nanowires, nanotubes, and graphene**
- **Oxide electronics** and **multiferroics**
- **Interfaces in photovoltaics,** e.g. Si passivation

Invited Presentations

This year's invited presentations will include:

- **Prof. Suman Datta,** Penn State University, USA—*Materials Selection and Device Design for Low Power Tunnel Transistors*

- **Dr. Robin Degraeve,** IMEC, Belgium—*Modeling SET and RESET transients in Hf-based RRAM devices using the Hourglass approach*
- **Dr. Thanasis Dimoulas,** NCSR DEMOKRITOS, Greece—*Growth and characterization of silicene and germanene*
- **Prof. Debdeep Jena,** University of Notre Dame, USA—*SymFET: A novel Graphene-Insulator-Graphene Tunneling Device*
- **Prof. Yasuyuki Miyamoto,** Tokyo University of Technology, Japan—*Heavily doped epitaxially grown source in InGaAs MOSFET for high drain current density*
- **Prof. Krishna Saraswat,** Stanford University, USA—*Low Resistance MIS Contacts to Ge and III-V Devices*
- **Prof. Susanne Stemmer,** University of California at Santa Barbara, USA—*Reducing EOT and Interface Trap Densities of High-k/III-V Gate Stacks*
- **Prof. Eric Vogel,** Georgia Institute of Technology, USA—*Frequency Dispersion in CV plots of MOS Devices on III-V Substrates: Disorder-Induced Gap States or Border Traps*

Wednesday evening Tutorial—free to all registered SISC attendees

Prof. Michelle Simmons, The University of New South Wales, Australia—*The development of a quantum computer in silicon*

Unique Poster Session

A unique feature of SISC is the attention paid to the poster presentations. Each author of a poster presentation has the opportunity to introduce their work orally, using two visuals, to the entire SISC audience during special poster introduction sessions. The posters are then presented during a separate poster reception on Thursday evening.

Best Student Presentation Award

SISC is a popular conference with students, who can get immediate and candid feedback on their latest results from the experts in the field. In addition to a strongly reduced registration fee for students, a Best Student Presentation award is given every year in memory of E. H. Nicollian, a pioneer in the exploration of the metal-oxide-semiconductor system who had a strong presence within the SISC.

Accompanying Program

The scientific content of the conference is complemented by informal events designed to encourage lively discussion and debate. A hospitality suite with complimentary drinks is available to attendees to continue their discussions on every evening of the conference. Friday afternoon has no scheduled talks, to allow time to meet informally, relax, or visit local attractions. On Friday evening the conference hosts a banquet and awards ceremony, complete with the now-famous (and always riotous) limerick contest. The limericks never fail to give the conference presentations, people and events an entirely new perspective.

SISC is always a rewarding experience for specialists, students, as well as newcomers to the field. For more information about the conference, to consult its program and to register, please visit **http://www.ieeesisc.org**. We look forward to seeing you at SISC 2013!

Chadwin Young
2013 SISC General Chair
KU Leuven, Belgium

Alex Demkov
2013 SISC Program Chair
Sematech, USA

Peide Ye
2013 SISC Arrangements Chair
University of Texas at Austin, USA

2013 IEEE International Semiconductor Conference (CAS)

The International Semiconductor Conference—CAS 2013 (www.imt.ro/cas) is now at the 36th edition and will be held in Romania, at the Hotel Rina Sinaia, in the mountain resort of Sinaia, October 14–16, 2013. Since 1995, the conference has been an IEEE event, sponsored by the IEEE Electron Devices Society.

The aim of the conference is two-fold. First, it provides a forum of debate on selected topics of scientific research and technological development. On the other hand, this is an occasion for refreshing a broad perspective of the participants through invited papers and tutorials. The Conference is underlying the development in micro-and nanotechnologies and it still maintaining the "traditional" connection with semiconductor electronics

The CAS conference has taken place every year since 1978. Until 1996 it was organized as the *Annual Semiconductor Conference* (in Romanian—**C**onferinta **A**nuala de **S**emiconductoare—CAS). Starting with 1991, CAS was opened to the international scientific community and changed its name accordingly to the *International Semiconductor Conference*, still maintaining the same acronym (CAS). Since 1997 the organizer of CAS has been the National Institute for Research and Development in Microtechnologies (IMT Bucharest).

The organizer, IMT Bucharest, coordinated by the Romanian Ministry

Bucegi mountains as seen from Sinaia resort in late fall

of National Education, is the main actor in microtechnologies in Romania. The mission of IMT consists of scientific research and technological development in micro-nano-bio-info technologies, technology transfer, education and training, dissemination, and development of the national strategy in the field. The institute is a "technological pole" for multidisciplinary activities, integrating research, education and technology transfer, playing a national role through networking and partnership (with Politehnica" University of Bucharest), emerging as a regional center. IMT was involved in 16 European projects in FP6, 12 European projects in FP7 and 10 European projects related to FP7 (ongoing and finished).

In the last decade, the Conference profile has gradually extended from semiconductor device physics and technology (including semiconductor materials and microelectronics) to micro- nano-and biotechnologies. The conference is an ideal forum for presentation of the latest results in:

- Nanoscience and nanoengineering
- Micro and nanotechnologies for biomedical and environmental applications
- Novel materials and intelligent materials
- Micro and nanotechnologies for transducers, interfaces and microsystems
- Microoptics and microphotonics
- Micromachined devices and circuits for microwave and millimeter wave applications
- Power devices and microelectronics (including CAD)
- Simulation and fabrication of microstructures and microsystems
- Semiconductor device physics and technology
- Design and technology of microelectronic components

CAS 2013 will begin with a half-day plenary session, followed by two and a half days of parallel technical sessions - oral and poster. The program includes also a Student Papers Session, allowing the students presenting their work to get immediate feedback from the experts in the field. A Best Student Paper Award is given every year by the IEEE Romania Section, EDS Chapter.

An important goal of the CAS 2013 is to provide an environment that encourages discussions and interactions between researchers from institutes, academia and companies all over the world. Conference participants have numerous opportunities for social gatherings. Organized coffee breaks, the conference lunches and gala dinner are also opportunities to meet and exchange ideas with colleagues.

CAS 2013 will be held in the mountain resort Sinaia, Romania, during the fall season, at the hotel having almost the same name, Rina Sinaia. The "Henri Coanda" Otopeni International Airport is 115 Km away from Sinaia.

Sinaia is situated at 800 meters altitude, just near the Bucegi Mountains chain, on the Prahova River Valley. The mountains are 2,500 meters at their highest altitude. Sinaia was developed around the Sinaia Monastery built at the end of the 17th century. The name comes from Mount Sinai. The small town of Sinaia, with its famous Peles Castle, formerly the Summer Royal Residence, is the favorite place outside Bucharest for international conferences and high-level meetings. The rocky landscape of the Prahova Valley is a paradise for mountain climbers. You may reach the height of 2,000 or 2,200 meters by cable or car and enjoy a walk without any special equipment

The papers, original and previously unpublished were submitted on-line and were reviewed in a blind review process. The invited and accepted papers are published in the 2013 CAS Proceedings (an IEEE publication), which will be delivered to the participants at the beginning of the conference.

For Call for Papers and further information regarding the next conference, CAS 2014, please visit the CAS website http://www.imt.ro/cas/. For additional information contact us at cas@imt.ro.

Dan Dascalu
2013 CAS General Chairman
IMT Bucharest
Romania

2013 IEEE International Electron Devices Meeting (IEDM)

(continued from page 1)

Sunday, December 8th and 90-minute afternoon tutorial sessions on Saturday, December 7th.

The traditional IEDM luncheon address given by a notable industry figure will be held on Tuesday, December 10th "The current state-of-the-art and Advances in Visual / GPU Computing," by Dr. David Luebke, Senior Director of Research, Nvidia Corporation

Building on the popularity of the inaugural Entrepreneurs Luncheon held at last year's IEDM, the event will be held once again, on Wednesday, December 11th. Speaker will be Steve Nasiri, Nasiri Ventures LLC, Nasiri Foundation.

Special Focus Sessions at the 2013 IEDM will include bioMEMS, analog devices and circuits, advanced semiconductor manufacturing, and terahertz devices. Overall, there will be increased participation this year in such topics as circuit and process technology interaction, energy harvesting, bio-sensors and bioMEMS, power devices, magnetics and spintronics.

Saturday Tutorials

The IEDM once again will hold two 90-minute Saturday tutorial sessions on emerging topics, on December 7th. Today's research and industrial environments feature an increased emphasis on cross-disciplinary work and technological integration, and these tutorials are intended to help attendees bridge the gap between textbook knowledge and the leading-edge research presented during the IEDM conference. Specific topics offered this year will include:

- Atomic-scale modeling and simulation for nanoelectronics
- Interface Properties for SiC and GaN MOS Devices
- Nano Electronics—The use of Low-Dimensional Systems for Device Applications
- Tunnel FETs—beating the 60 mV/decade limit
- 3D chip-stacking
- Energy harvesting for self-powered electronic systems

Short Courses

There will be two day-long short courses on Sunday, December 8th. Process Complexities of 10 nm and 7 nm Technologies will explore the issues involved with the continued scaling of conventional technology, while Beyond CMOS: Emerging Materials and Device Concepts will delve into alternative ways to achieve desired functions and performance in future devices.

Evening Panel Sessions

There will be two evening panel sessions on Tuesday, December 10th, designed to foster discussion and debate on important technical and industry issues:

- "What will ultimately limit Vcc scaling of devices: variability, off-state power, performance?"
- "Is there life beyond conventional CMOS?"

Technical Program

Original papers will be presented in the following technical areas:

- Circuit and Device Interaction
- Characterization, Reliability and Yield
- Display and Imaging Systems
- Memory Technology
- Modeling and Simulation
- Nano Device Technology
- Power and Compound Semiconductor Devices
- Process and Manufacturing Technology
- Sensors, MEMS and BioMEMS

Plenary Talks

Andrea C. Ferrari, University of Cambridge

"Graphene Future Emerging Technology"

Mitsumasa Koyanagi, Tohoku University

"Heterogeneous 3D Integration-Technology Enabler Towards Future Super-Chips"

Geoffrey Yeap, VP, Qualcomm

"Smart Mobile SoC Driving the Semiconductor Industry: Technology Trend, Challenges and Opportunities"

Further Information

For registration and other information, visit the IEDM 2013 home page at www.ieee-iedm.org or contact the Conference Office at 19803 Laurel Valley Place, Montgomery Village, MD 20886, USA; tel. (301) 527-0900, ext. 2; fax (301) 527-0994; or e-mail: iedm@his.com.

Follow the IEDM on Twitter and Facebook at the following links to receive updates:

Twitter: http://twitter.com/ieee_iedm

Facebook: http://www.facebook.com/IEEE.IEDM

The Washington, D.C. area provides many attractions for visitors and we encourage attendees to explore them in the off hours of the conference. The IEDM committee members look forward to seeing you in December.

Ken Rim
2013 IEDM Publicity Chair
IBM Corp.
Hopewell Junction, NY, USA

Suman Datta
2013 IEDM Publicity Vice Chair
Penn State University
University Park, PA, USA

Society News

Message from EDS President Paul Yu

Dear EDS Members,

Paul Yu
EDS President

When you read this article, you probably sense that I am wrapping up the final quarter of my tenure as EDS president. Still, following our very successful and productive Board of Governors (BoG) meeting series hosted by our colleagues in the EDS Hong Kong Chapter, I feel that we are just getting started!

To that point, I want to discuss with you two important new initiatives we are undertaking to help grow, strengthen, and engage our membership. Please take a moment to read the following and consider getting involved. We are a member-led, member-driven society. Let's live up to that ideal.

EDS Mission Fund Established

EDS prides itself on doing the utmost to realize the mission of the society. In addition to our technical publications and conferences, we carry out our mission through a robust suite of humanitarian, educational, and research initiatives such as our technical and career-oriented webinars, focused tutorials, Distinguished Lecturer/Mini-Colloquia Program, graduate student fellowships, and awards programs.

With a dedicated volunteer corps, and an engaged, capable professional staff, the society is poised to greatly expand our mission-driven initiatives beyond their current scope and reach. We have the programs and processes in place to more effectively leverage our human resources for such expansion. What we lack is sufficient capital. Therefore, earlier this year, EDS Treasurer Ravi Todi and Executive Director Chris Jannuzzi began working on a proposal to establish an IEEE Foundation account specifically for us: *The EDS Mission Fund*.

I am very pleased to announce that at the June IEEE Meeting Series, the IEEE Foundation Board unanimously approved establishing EDS's Fund, thus greenlighting us to begin our own development efforts. The additional capital raised by the foundation will be used exclusively for our critical, mission-related activities such as our student fellowships and EDS-ETC Snap Kits program, as well as new Awards.

To ensure a smooth launch in 2014, our next step is to form a committee to oversee development efforts and outreach and to manage the flow of funds back to our constituents around the globe. I have asked Ravi to serve as the inaugural chair of this committee and he has graciously accepted that post, on top of his other duties as EDS Treasurer.

General Elections Pilot

The Members-at-Large of the Board of Governors (formerly Administrative Committee/AdCom) function as the society's main legislative body. They have full voting privileges in elections regarding society business, bylaws and constitution revisions, and for key posts such as President, Treasurer, and Secretary. Each year, 6 or 7 new Members-at-Large are elected to replace those whose terms are ending. Currently, it is only the sitting Members-at-Large and the EDS Officers who are able to vote in this election.

During the June meeting in Hong Kong, the BoG voted and approved to launch a pilot program to test the effectiveness of having selected Member-at-Large seats voted on by the general membership. You may recall that we sent a survey about this to all members earlier in 2013. Although the response rate to the survey was lower than we would have liked, the results were clear from those who responded that there is strong support for general elections in EDS.

Therefore, beginning with the 2014 elections, 1 BoG seat per year will be elected by the general membership. After a five year period, we will assess the success of the program to determine if we want to make this a permanent part of EDS's operations.

I have asked EDS Senior Past President Cor Claeys, to lead the team charged with not only managing the logistics of the general election, but also defining how the success and benefit of the program will be measured.

Your Part in This

As you can see, these are major new initiatives we have launched. Both are long-term projects so please check the EDS website and this newsletter for the latest information and updates.

Lastly, I would like to say if you are a member of EDS, but have not yet had an opportunity to directly contribute to the society, I sincerely hope that our Mission Fund and our General Elections will provide you the means to do so now. We are at a critical juncture in history. As the technologies we in EDS help develop converge with the social,

political, and environmental well-being of the world at large, it has never been more important for us to advance EDS's mission of *promoting excellence in the field of electron devices for the benefit of humanity*. Help us achieve our mission by getting involved today!

Paul Yu
EDS President
University of California at San Diego
San Diego, CA, USA

June 2013 BoG Meeting Summary

Fernando Guarín
EDS Secretary

The 2013 Mid-year meeting of the IEEE Electron Devices Society Board of Governors (BoG), took place at The Hong Kong Polytechnic University - Hong Kong, China on June 2, 2013.

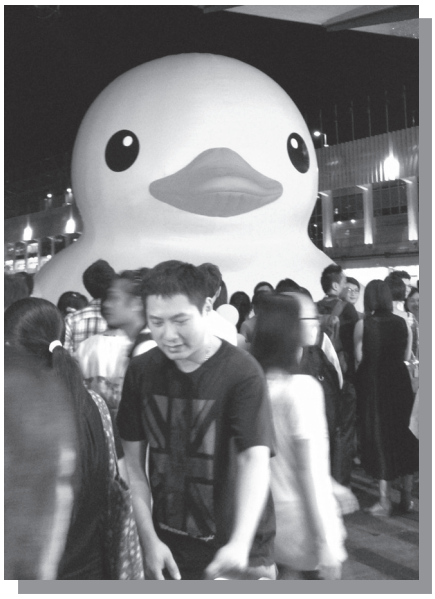
The Agenda and motions were as follows:

Agenda

- **Welcome & President's Report**
  Paul Yu
- **ExCom Update**
  Albert Wang
- **Secretary's Report**
  Fernando Guarin
- **General Election Update**
  Paul Yu
- **AdHoc Committee on Constitution & Bylaws Consistency Report**
  Simon Deleonibus
- **Meetings & Conferences Report**
  Bin Zhao
- **Treasurer's Report**
  Ravi Todi
- **Regions & Chapters Report**
  Joe Zhou
- **Publications Report**
  Samar Saha
- **Fellow Evaluations Committee Report**
  Leda Lundardi
- **Technical Activities Report**
  Joachim Burghartz
- **Educational Activities Report**
  Meyya Meyyappan
- **Nominations & Elections Report**
  Renuka Jindal
- **Newsletter Report**
  MK Radhakrishnan
- **Membership Report**
  Jamal Deen
- **Awards Report**
  Marvin White
- **Closing Remarks**
  Paul Yu

Motions

To approve the proposed list of 2013 committee appointments. MOTION PASSED UNANIMOUSLY



Florentijn Hofman's 54 foot+, floating duck sculpture called "Spreading Joy Around the World," entertained EDS BoG Members during their visit to Hong Kong

ExCom Update

To approve the 2014 Mid-Year meeting location. MOTION PASSED UNANIMOUSLY

Secretary's Report
To approve the December 2012 BoG meeting minutes. MOTION PASSED UNANIMOUSLY

General Election Update
To approve a general election for selected BoG seats. MOTION PASSED UNANIMOUSLY

Meetings and Conferences Report
To approve the list of 2014 repeat conferences.

Treasurer's Report
To approve 2014 Publication Page Counts. MOTION PASSED UNANIMOUSLY

To approve 2014 Member Prices for Publications. MOTION PASSED UNANIMOUSLY

To approve 2014 EDS Membership Dues. MOTION PASSED UNANIMOUSLY

To approve the first pass of the 2014 EDS budget. MOTION PASSED with 17 in favor, 1 opposed

To approve the establishment of the EDS Foundation. MOTION PASSED UNANIMOUSLY

Closing Remarks
To adjourn the meeting. MOTION PASSED UNANIMOUSLY

Fernando Guarín
EDS Secretary
IBM Microelectronics
New York, USA

EDS Board of Governors Members-at-Large Election Process

The Members at Large (MAL) of the EDS Board of Governors are elected for staggered 3 year terms, with a maximum of two consecutive terms. The 1993 Constitution and Bylaws changes mandated increasing the number of elected MAL from 18 to 22, and required that there be at least two members from each of the following geographic areas: Regions 1–7 and 9; Region 8; Region 10. In 2003, EDS made changes to its Constitution and Bylaws to require that at least one elected BoG member is a Graduate of the Last Decade (GOLD member). A GOLD member is defined by IEEE as a member who graduated with his/her first professional degree within the last ten years. It is also required that there are at least 1.5 candidates for each opening. In 2013, seven positions will be filled.

The election procedure begins with the announcement and Call for Nominations in the *EDS Newsletter*. The slate of nominees is developed by the EDS Nominations Committee and includes the non Committee and self nominations received. Nominees are asked to submit a two page biographical resume and an optional 50 word personal statement in a standard format.

Nominees for these positions should have previously served for at least one year as a member of an EDS committee or served as VP, Publication Editor, Representative and/or Chapter Chair. Also, each nominee must be endorsed by a 'full' voting member, i.e., one of the four officers (President, President-Elect, Treasurer or Secretary), the Jr. or Sr. Past President or one of the 22 current BoG Members-at-Large. Self-nominations are allowed. Endorsers can send a brief email to Laura Riello stating that they would like to endorse the candidate. Please note that there is no limit to the number of candidates that a full voting BoG member can endorse.

Nominations are closed on October 15th, and the biographical resumes and endorsement letters are distributed to the 'full' voting members of BoG prior to the December BoG meeting. The election is then held after the conclusion of the meeting.

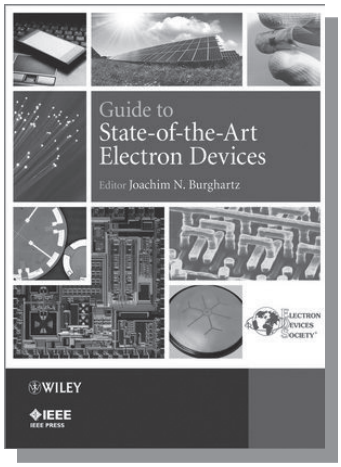
Renuka Jindal
EDS Jr. Past President
University of Louisiana
Lafayette, LA, USA

Report from the EDS Vice-President of Technical Activities

Joachim N. Burghartz
EDS Vice President of Technical Activities

The technical activity committees (TACs) of EDS represent a 'brain force' of currently 143 expert EDS members from industry, academia and government institutions. Many of them, as well as the outgoing TAC chairs contributed to our EDS anniversary text book '**Guide to State-of-the-Art Electron Devices**' which was put together to celebrate the 35th birthday of EDS and the foundation of an electron devices group in the IRE 60 years ago. This book was designed to both serve as a 'Wikipedia of modern electron devices', as IEEE Fellow Tak Ning states in his endorsement. Another EDS pioneer and endorser, Nick Holonyak, recommends it as a 'valuable resource for researchers and engineers engaged in work on semiconductor devices.' The book's cover reminds on the 50th anniversary booklet that is available for download on EDS's home page. Inside it looks quite different from the common reference book. In the 21 chapters that cover the entire field

of electron devices easy-to-read sidebars help define important terms and allow the electron device novice an easy entry into our field of interest. As a unique feature we also included a historic time line with many milestones in electron device research and development, which is laid out as a movie strip and runs at the bottom part of the pages through the entire book. The three different colors of the strip indicate the eras of electron devices, i.e. the time before the start of an ED group in the IRE in 1952, the time period after that until EDS was born in 1964, and up to the present. All together more than 70 authors contributed, including a foreword by Nobel laureate George E. Smith. Due to financial support by EDS this anniversary book can be purchased for only $25.00 + S/H, by IEEE members directly from the EDS office (see EDS web site), at some EDS sponsored conferences and possibly through your local chapter. If you are a chapter chair and would like to place a bulk order of this book, please contact the EDS office. And most importantly, please spread the word and recommend this special book to your colleagues and friends.



Joachim N. Burghartz
EDS Vice President of Technical Activities
IMS Chips
Stuttgart, Germany

Report on the 2013 EDS Region 10 Chapters Meeting

The EDS Region 10 Chapters Meeting was successfully held on June 1, 2013, in conjunction with the Society BoG Meeting in Hong Kong. The half-day meeting at the Hong Kong Polytechnic University was chaired by SRC Chair Steve Chung and attended by SRC Vice Chairs Ru Huang, Mansun Chan, and M.K. Radhakrishnan, as well as chapter chairs/representatives from more than 16 chapters.

Addressing the meeting, VP of Regions/Chapters Xing Zhou pointed out the prominence of Chapter activities by proper coordination and the importance of recognitions through Chapter of the year awards and volunteer appreciations. Steve Chung gave a summary report of Region 10 chapters and major activities in the past year, including the proposed mentorship by SRC Chair and Vice-chairs through 5 sub-region wise grouping of Chapters. He also mentioned that Region 10 with 52 chapters now remains to be the most active and largest growing region in EDS. Four New Chapters formed recently include ED National Taiwan University Student Branch Chapter, ED/SSC Gujarat Section Joint Chapter, EDS IIT-Roorkee Student Branch Chapter, and ED Graduate University of Chinese Academy of Sciences Student Branch Chapter. Five more chapters are in the formation process/under discussion. More importantly, he mentioned that several flagship conferences in Region 10 with local chapters as a major organizer have been very important, since these activities will give initiatives in the promotion of memberships. There are four mini-colloquia being planned towards the end of the year.

The meeting was then followed by individual chapter chair's reports, including chapters from Tainan

EDS Region 10 Chapter Meeting Attendees

(Wen-Kuan Yeh), Hyderabad (M. Srinivas), Madras (N. Mohankumar), NIST Student Branch (Ajit Kumar Panda), SJCE Mysore Student Branch (Rakesh Kumar), HITK Student Branch (Atanu Kundu), Singapore (C. K. Tan), Tsinghua (Haiming Zhao), India Council (M. Madheswaran), Xi'an (Hongliang Lv), Chengdu (Wei Li), Calcutta (Chandan Sarkar), Beijing (Ming Liu), Shanghai (Yu-Long Jiang) and Japan Council (Akira Toriumi).

After the presentation, an open forum was conducted for chapter chairs and all attendees to express their views and the experiences for the betterment of Chapter activities. Significant points from the discussion include: (1) How the SRC can be more effective in bridging the gap between the EDS HQ and chapters, (2) Ways to provide more incentive for members to become volunteers and how the active volunteers can be properly rewarded, (3) Proper utilization of chapter funds and resources for the benefit of members, (4) Modalities for chapters to become financially self-sufficient and sustainable, and (5) Effective methodology for better information to SRC about potential chapter formations.

Consensus on the above discussions includes proper communication at all levels and Steve Chung mentioned that all the chapter chairs will be informed about the SRC mentorship as soon as it is finalized. Zhou Xing informed that in future the Chapter of the Year award will be region-wise which will provide more recognition to active Chapters. Also, volunteer recognition is planned and Chapters in the South Asia group has already initiated such appreciations. The meeting concluded with a group photo session.

Steve Chung
Region 10 SRC Chair
National Chiao Tung University
Hsinchu, Taiwan

M.K. Radhakrishnan
Region 10 SRC Vice-Chair
NanoRel
Bangalore, India

Report on the Joint Regions/Chapters and Membership Committee Meeting

Xing Zhou
EDS Vice-President
Regions/Chapters

Jamal Deen
EDS Vice-President
of Membership

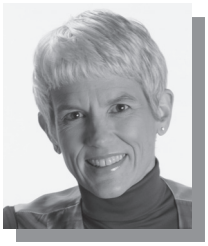
A joint Regions/Chapters and Membership Committee Meeting was held June 1, 2013, following the Region 10 Chapters Meeting in Hong Kong. All the participating chapter chairs/representatives also joined the meeting together with committee members, SRC-AP chair/vice-chairs, and ExCom members. Unlike usual committee meetings, this joint committee meeting had an opportunity to "touch the ground" with grass-root volunteer leaders and to listen to their feedback and suggestions. The topics were centered on how to serve members and reward volunteers at the society/region/chapter levels. The goal is to have more (inactive) members becoming (active) volunteers at various society/region/chapter levels. In this respect, SRC can play a more active role and SRC chairs/vice-chairs should be given more incentives and authorities for promoting coordinated regional/chapter activities as well as rewarding active volunteers at the regional/chapter levels. For example, SRC chairs/vice-chairs can play a more active role in coordinating MQ/DL events, organizing joint-chapter activities and chapter visits, membership promotions, and various certificates of recognition for chapters and individual volunteers in the region.

EDS has invested large amounts of funds in regional/chapter as well as membership promotions. We have $40k total for the chapter subsidy budget, $20k total for the SRC budget, and $40k total for the MQ budget for 2013. However, participation and activities are not uniform among various regions and chapters. For example, application for the 2013 chapter subsidy request is only 38%, and the 2012 SRC budget utilization for various regions was around 50% and below (except for Region 10, which was 95%). There is still room for improvements and it calls for more coordinated efforts. In this respect, Region 10 and its chapters can play a proactive role in initiating new ideas and practices.

Xing Zhou
EDS Vice President of Regions & Chapters
Nanyang Technological University
Singapore

Jamal Deen
EDS Vice President of Membership
McMaster University
Canada

2012 EDS Paul Rappaport Award



Kelin J. Kuhn

A high priority of the Electron Devices Society is to recognize and enhance the quality of papers published in EDS archival literature. Every year, the Society confers its prestigious Paul Rappaport Award to the best paper published in the IEEE Transactions on Electron Devices. Among other criteria including technical excellence, an important metric for selection for the award is comprehensive and impartial referencing of prior art. The winning paper was selected from close to 550 articles that were published in 2012. The winning paper is entitled, "Considerations for Ultimate CMOS Scaling." This paper was published in the July, 2012 issue of the *IEEE Transactions on Electron Devices,* and was authored by Kelin J. Kuhn. The award will be presented at the EDS Board of Governors Meeting to be held in early December 2013, in Washington, D.C. In addition to the award certificate, the author will receive a check for $2,500. On behalf of the Electron Devices Society, I would like to congratulate Kelin Kuhn for this achievement. A brief biography of the author is given below.

Dr. Kelin J. Kuhn is an Intel Fellow and Director of Advanced Device Technology in the Technology and Manufacturing Group of the Intel Corporation. Dr. Kuhn joined Intel in 1997 and has been involved in Intel's technology development for the 0.35 micron, 130 nm, 90 nm, 45 nm, 22 nm and 14 nm technology nodes. Previously, she was an Associate Professor in the Department of Electrical and Computer Engineering at the University of Washington. Dr. Kuhn is an IEEE Fellow, the past recipient of a National Science Foundation Presidential Young Investigator Award for her work on strained layer III-V materials and two Intel IAA awards, one for her work on Hi-K metal gate transistors and one for her work on the 22 nm TriGate transistor. Dr. Kuhn earned her bachelor's degree in electrical engineering from the University of Washington in 1980. She received her master's and doctoral degrees in electrical engineering from Stanford University in 1985.

Samar Saha
EDS Vice-President of Publications
Ultrasolar Technology, Inc.
Santa Clara, CA, USA

2012 George E. Smith Award

A high priority of the Electron Devices Society (EDS) is to recognize and enhance the quality of papers published in EDS archival literature. The George E. Smith Award was established in 2002 to recognize the best paper appearing in a fast turnaround archival publication of EDS, targeted to *IEEE Electron Device Letters*. Among other criteria including technical excellence, an important metric for selection for the award is comprehensive and impartial referencing of prior art.

The paper winning the 2012 George E. Smith Award was selected from among 500 articles that were published in 2012. The article is entitled *"Tri-Gate Normally-Off GaN Power MISFET."* This paper appeared in the March, 2012 issue of *IEEE Electron Device Letters,* and was authored by Bin Lu, Elison Matioli and Tomás Palacios. The award will be presented at the IEEE International Electron Devices Meeting (IEDM) to be held in early December, 2013 in Washington, D.C. In addition to the award certificate, the authors will receive a check for $2,500. On behalf of the Electron Devices Society I would like to congratulate the authors for this achievement. Brief biographies of the authors follow.

Bin Lu received his B.S. degree from Tsinghua University, Beijing, China, in 2006 and the M.S. and Ph.D. degrees from the Massachusetts Institute of Technology in 2007 and 2013, respectively, all in Electrical Engineering. His current research interest is on GaN-based power semiconductor devices.

Tomas Palacios is the Emmanuel Landsman CD Associate Professor in the Department of Electrical Engineering and Computer Science at the Massachusetts Institute of Technology, where he leads the Advanced Semiconductor Materials and Devices Group. His research focuses on the combination of new semiconductor materials and device concepts to advance the fields of information technology, biosensors and energy conversion. His work has been recognized with multiple awards including the 2011 Presidential Early Career Award for Scientists and Engineers (PECASE) and numerous best paper awards. Prof. Palacios has authored more than 200 contributions on advanced semiconductor devices in international journals and conferences,

40 of them invited, 3 book chapters and 8 patents. He is the founding director of the MIT Center for Graphene Devices and 2D Systems, and the MIT GaN Energy Initiative.

Elison Matioli received his B.Sc. degree from Ecole Polytechnique (France) in 2006 and his Ph.D. degree from the Materials Department at the University of California, Santa Barbara in 2010, working on GaN-based LEDs and solar cells. He is currently a post-doctoral fellow in the Electrical Engineering and Computer Science Department at MIT working on GaN-based transistors.

Samar Saha
EDS Vice-President of Publications
Ultrasolar Technology, Inc.
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Technical Activities Committee on Compact Modeling launches platform on Verilog-A modeling

Colin McAndrew
EDS Compact Modeling TAC Chair

Research and development on semiconductor devices has been an exciting field to work in for the past 60 or so years. That field, and many of our jobs, has been funded by the economic engine that is the microelectronics industry: Basic device research is fun and intellectually satisfying, but it is the integrated circuits (ICs), and products they are used in, that provide the revenue needed to keep the industry moving forward. Since the 1970's IC design has been based on SPICE simulation, and the basic electron devices are encapsulated in SPICE in the form of models, called *compact models*. Compact models are, in essence, the key link between process technologies and circuit design. As devices, and the physical phenomena that affect their electrical behavior, continue to evolve, so must compact models. Although there is an industry standards body for the area, the Compact Model Coalition (CMC), it strives to respond quickly to business needs rather than driving for the best possible technical and physically rigorous approaches and solutions. The IEEE Electron Devices Society therefore has a Technical Area Committee (TAC) on compact modeling (CM) to concentrate on the technical aspects of compact modeling.

After several rounds of brainstorming, on where the IEEE EDS CM-TAC (that's quite a mouthful of acronyms!) could most profitably direct its attention, we came up with a list that includes these items:

- Officially document compact model benchmarks (assemble and place under the IEEE umbrella all the existing work on benchmarks).
- Provide standard Verilog-A macro definitions for general common compact modeling needs.
- Provide standard Verilog-A macro definitions for *p-n* junctions (which appear as intentional or parasitic parts of many semiconductor devices).
- Define coding standards for Verilog-A.
- Provide simple but non-trivial Verilog-A examples for people to use as a starting point for other models.

This is an aggressive set of goals, but by setting standards to evaluate the physical correctness of compact models and collating and expanding best practices in Verilog-A coding of compact models we intend to help the industry raise the bar on quality. The need for education in these areas may seem curious: Surely it's obvious whether a compact model is physically correct or not? And the adoption of Verilog-A as the *de facto* standard for compact modeling a decade ago completely removed the major cause of errors in compact model (wrong derivatives; these are automatically generated in Verilog-A), so Verilog-A models should be higher quality than C code, right?

Sadly, that is not always the case. Verilog-A is a flexible language, flexible enough to allow you to implement unphysical or poorly converging models (gives you "enough rope to hang yourself" as the saying goes). And it significantly lowers the entry barrier to developing a compact model, opening the field to people not tutored in how to write a good model. Best practices for writing models in Verilog-A have been documented, but are not widely known and rarely followed. The initial focus of the CM-TAC has therefore been on assembling, extending, and explaining the reasons that underlie recommended best practices for Verilog-A modeling, and providing standard macro definitions to help people writing Verilog-A models adopt common practices (besides providing a more consistent coding style for models this can also help EDA companies implement models). We have had several rounds of iteration in documenting the best practices and standard macro definitions, and are now deciding how

to disseminate them. To make them universally available an Open Access publication seems appropriate for the best practices document, and as the standard macros will evolve over time the EDS web site is a good place for them. We are now finalizing those details.

Colin McAndrew
EDS Compact Modeling TAC Chair
Freescale Semiconductor
Tempe, AZ, USA

Report on the VLSI Technology and Circuits Committee Meeting, held in Kyoto, Japan

The VLSI Technology and Circuits Committee Meeting was held, June 13, 2013, at the site of the 2013 Symposium on VLSI Technology in Kyoto, Japan.

The committee has annual face-to-face meeting in December at the IEDM, but to enhance the committee's activity, we decided to test having our members meet in June at the Symposium.

Some of the key discussions at the meeting were:

1. Try to invite members from less-active areas to encourage them to contribute more on VLSI technology
2. Create a closer relationship with SEMI
3. Keep or enhance the relationship with VLSI Symposia and IEDM
4. Work closer with ITRS
5. Combine some workshops and conferences to expand field of coverage
6. Continue to propose special issues for journals

Attendees at the Committee Meeting (from left to right), Hitoshi Wakabayashi, Kaz Ishimaru, Steve Chung, Shu Ikeda, Hiroshi Iwai and Seiichiro Kawamura

Some suggestions to enhance activities of this committee are also proposed.

1. Create subcommittee and place sub-committee chair(s)
2. Place vice chair
3. Create a local sub-committee

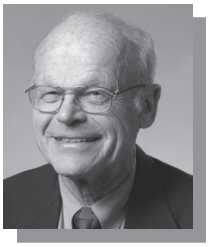
At our recent committee meeting, Kaz Ishimaru volunteered to be a Conference/Workshop Chair and Seiichiro Kawamura to be the Publicity Chair.

Seiichiro Kawamura
Publicity Chair
JST/CRDS
Tokyo, Japan

Shu Ikeda
VLSI Technology and Circuits Committee Chair
Tei Technology
Austin, TX, USA

EDS Members Named Recipients of 2013 IEEE Medals

2013 IEEE/RSE WOLFSON JAMES CLERK MAXWELL AWARD



Richard S. Muller of the University of California, Berkeley, has been named one of the recipients of the 2013 IEEE IEEE/RSE Wolfson James Clerk Maxwell Award.

For pioneering innovation and leadership in micro-electro-mechanical systems (MEMS) technology

The individual and collective contributions of Richard S. Muller and Richard M. White to the development and advancement of micro-electro-mechanical systems (MEMS) have resulted in technologies critical to applications ranging from cell phones to air-bag sensors in automobiles. Dr. White's development in 1965 of a microfabricated surface acoustic wave (SAW) electric filter is considered an early example of a MEMS device and the first

to receive worldwide commercial attention. Today's mobile phones rely on SAWs based on Dr. White's work in order to function properly. Dr. Muller's research in 1965, which demonstrated mechanical coupling into microelectronic devices and his further work on fabrication processes during the 1980s, were fundamental to the growth of MEMS. Dr. Muller and his research group introduced polysilicon as a structural mechanical material and pioneered "surface micromachining" for creating MEMS devices. In 1981, Dr. Muller proposed successfully to the IEEE the creation of the *Journal of Microelectromechanical Systems* and served as its Editor-in-Chief from 1997 to 2012. Together, Drs. Muller and White in 1986 founded the Berkeley Sensor & Actuator Center (BSAC) at the University of California with the support of the National Science Foundation (NSF). Under this pair's guidance, together with a subsequent growing number of BSAC Directors, their industry/university cooperative research center has educated generations of students, developing some of the premier researchers active today in the MEMS field. BSAC researchers have investigated and contributed in a broad area of MEMS advances, including those making possible the accelerometers and gyroscopes found in automobile safety systems.

Dr. Muller is an IEEE Life Fellow and member of the U.S. National Academy of Engineering. His many honors include the IEEE Cledo Brunetti Award (joint with R.T. Howe in 1998) and Third-Millennium Medal (2000). He is a Professor Emeritus and Professor in the Graduate School in the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley.

Dr. White is an IEEE Life Fellow and member of the U.S. National Academy of Engineering. His many honors include the IEEE Cledo Brunetti Award (1996). He is a Professor Emeritus with the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley.

2013 IEEE JUN-ICHI NISHIZAWA MEDAL

Burn J. Lin of the Taiwan Semiconductor Manufacturing Company, Hsinchu, has been named the recipient of the 2013 IEEE IEEE Jun-Ichi Nishizawa Medal.

For contributions to lithographic manufacturing, including immersion lithography

Burn J. Lin has pushed the envelope in developing advanced lithography methods and his innovations have revolutionized integrated circuit production to enable the continued miniaturization of electronic devices. Dr. Lin's vision has consistently provided advancements to extend the potential of optical lithography. He pioneered immersion lithography and was the driver of its adoption by the semiconductor industry over traditional optical lithography methods. Optical lithography is used to delineate the circuit patterns of an integrated circuit and has enabled feature sizes to be scaled in electronic devices. However, when the industry was looking to reduce the imaging wavelength from 197- to 157 nm to achieve the next reduction in device feature size, Dr. Lin saw an expensive dead end with current optical lithography methods and proposed immersion lithography in 2002. With immersion lithography, Dr. Lin demonstrated that replacing air with water in the gap between the lens and wafer surface provided higher resolution potential than with dry optics. His perseverance in convincing the industry to make the change to immersion lithography has extended Moore's law from 40 nm to potentially as low as 10 nm. At least 82% of all transistors currently in the world have been made with immersion lithography, which is a testament to Dr. Lin's impact. Throughout his 42-year career in lithography, Dr. Lin has pioneered deep-UV lithography, multilayer resist systems, simulation of partially coherent images in 3D, resolution and depth of focus scaling equations, Exposure-Defocus window, and k_1 reduction with resolution restoration and enhancement.

An IEEE Life Fellow and member of the U.S. National Academy of Engineering, Dr. Lin's many honors include the IEEE Cledo Brunetti Award (2009). Dr. Lin is a Vice President of Research and Development and the Distinguished Fellow with the Taiwan Semiconductor Manufacturing Company, Ltd., Hsinchu, Taiwan.

Marvin White
EDS Vice-President of Awards
Ohio State University
Columbus, OH, USA

IEEE Fellow and EDS Member Wins The 2013 IEEE CAS Industrial Pioneer Award

Rajiv Joshi

Dr. Rajiv Joshi of IBM's Watson Research Center in New York has been named the winner of "Industrial Pioneer" award by the IEEE Circuit and Systems Society. Dr. Joshi received this award at the 50th Design Automation Conference in Austin, Texas. The citation states "For pioneering contributions to VLSI memory design and technology".

Since 1984 Dr. Joshi has made seminal contributions to VLSI memory design through innovative circuits, leading-edge technology and novel predictive CAD techniques for variability and yield analysis. These are the critical ingredients for high-performance design in scaled technology. These techniques, processes and inventions, which are now pervasively used throughout the IC industry, His pioneering work on leading the development and commercialization of statistical methodologies for variability analysis, novel memories and application of new technologies to SRAMs have paved the way for widespread industrial adoption of these techniques. The technique demonstrated a whopping five orders of magnitude speedup over the traditional Monte Carlo methodology and is adopted for logic as well. Dr. Joshi was the first to design a high-performance multiport register file (a fast memory on CPU), utilizing innovative dynamic self-resetting CMOS concepts in an SOI technology. The novel circuits overcame many unique SOI design challenges (e.g. history-dependence of switching delays, lower noise margins, and parasitic bipolar discharge current). Through this innovation, Dr. Joshi demonstrated major performance advantages of SOI design over bulk, resulting from smaller diffusion capacitances, increased current drive due to lower threshold voltages, and a reduction in the back-bias effect of stacked devices. This provided one of the basis for IBM and others to switch to SOI from bulk around 1999. Dr. Joshi has also made major contributions to other new memories, such as MRAMs, TRAMs, and e-DRAMs, through introduction of intellectual property (IP) as well as newly developed variability analysis that is the key to understand the manufacturing yield and optimize circuits.

His high speed, robust SRAM memory work (over 6.6 GHz) along with new concepts related to dynamic margin analysis and variability methodology received worldwide attention and utility.

Also in technology side, Joshi's pioneering contributions to improve memory and logic performance through several innovations utilizing copper interconnects with PVD liner and tungsten as the M0-level and first-level contact and a dual damascene structure to implement a homogeneous interconnect to improve electromigration characteristics by an order of magnitude is globally used.

Dr. Joshi has published widely in this field and has over 190 U.S. patents and more than 350 including international patents. Dr. Joshi is an IEEE fellow and a research staff member at IBM, T. J. Watson Research Center, New York.

Fernando Guarin
EDS Secretary
IBM Microelectronics
New York, USA

IEEE Transactions on Semiconductor Manufacturing Best Paper Award

The IEEE Transactions on Semiconductor Manufacturing Best Paper Award is presented to the authors of that paper considered by the Transactions' Editorial Staff and reviewers to be the outstanding paper published during the year. The Award is based on the accuracy, originality, and importance of the technical concepts, as well as the quality and readability of the manuscript. The Best Paper is also based on the immediate or potential impact that this work will have on the overall semiconductor manufacturing industry.

I am pleased to announce the Best Paper for the Transactions published in 2012. This year, the editors chose "*Lens Heating Induced Aberration Prediction via Nonlinear Kalman Filters*," by Can Bikcora, Martiijn van Veelen, Siep Weiland, and Wim M. J. Coene. C. Bikcora, S. Weiland and W. M. J. Coene (Eindhoven University, The Netherlands); M. van Veelen and W. M. J. Coene (ASML Netherlands B.V). Their paper explored experimental results with various Bayesian strategies (Extended Kalman Filter and Unscented Kalman Filter) intended to counteract lens heating induced aberrations in photolithography. This paper presented

excellent work in modeling and evaluation, was based on mathematical and quantitative methods, and followed up with solid experimental results. Also, the paper represented an excellent partnership between industry and academia on a problem of real value to the industry.

Sean P. Cunningham
T-SM Editor-in-Chief
Intel Corporation
Santa Clara, CA, USA

Congratulations to the 24 EDS Members Recently Elected to IEEE Senior Member Grade!

Behraad Bahreyni
Badariah Bais
Steven Daniel
Boyd Fowler
Ying Go
Venkatnarayan Hariharan
Md Zahid Hossain
Wan-Thai Hsu
Colin Joye*
Jeong-Soo Lee
Steve Lytle
James Maloney
Janice Nickel
Ajit Panda
Kalyan Rapolu
Slava Rotkin
Udo Schwalke
Saurabh Sirohi
William So
Vishnu Srivastava
Muhammad Talukder
Yukiharu Uraoka
Wyman Williams
Ernest Wu

* 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.

Please remember to designate the Electron Devices Society as your nominating entity!

For more information on senior member status, visit: http://www.ieee.org/membership_services/membership/senior/index.html

To apply for senior member status, fill out the on-line application: https://www.ieee.org/membership_services/membership/senior/application/index.html

You will need to Sign-in with your IEEE account.

EDS Senior Member Program

Jamal Deen
EDS Vice-President of Membership

The Electron Devices Society established the EDS Senior Member Program to both complement and enhance the IEEE's Nominate-a-Senior-Member Initiative and make IEEE/EDS members aware of the opportunity and encourage them to elevate their IEEE membership grade to Senior Member. This is the highest IEEE grade for which an individual can apply and is the first step to becoming a Fellow of IEEE. If you have been in professional practice of 10 years, you may be eligible for Senior Membership.

Benefits of Senior Membership[1]

- **Recognition:** The professional recognition of your peers for technical and professional excellence.
- **Senior member plaque:** Since January 1999, all newly elevated Senior members have received an engraved Senior Member plaque to be proudly displayed for colleagues, clients and employers to see. The plaque, an attractive fine wood with bronze engraving, is sent within six to eight weeks after elevation.
- **US$25 coupon:** IEEE will recognize all newly elevated Senior members with a coupon worth up to US$25. This coupon can be used to join one new IEEE society. The coupon expires on 31 December of the year in which it is received.
- **Letter of commendation:** A letter of commendation will be sent

to your employer on the achievement of Senior member grade (upon the request of the newly elected Senior member).

- **Announcements:** Announcement of elevation can be made in section/society and/or local newsletters, newspapers and notices.
- **Leadership Eligibility:** Senior members are eligible to hold executive IEEE volunteer positions.
- **Ability to refer other candidates:** Senior members can serve as a reference for other applicants for senior membership.
- **Review panel:** Senior members are invited to be on the panel to review senior member applications.
- **US$25 referral coupon:** Newly elevated Senior members are encouraged to find the next innovators of tomorrow and invite them to join IEEE. Invite them to join and the new IEEE member will receive $25 off their first year of membership.

As part of the IEEE's Nominate-a-Senior-Member Initiative, the nominating entity designated on the member's application form will receive US$10 from IEEE for each application approved for Senior Member grade when there are at least five approved applications. As an EDS member, we would appreciate it if you could indicate on your Senior Member application form that **EDS** is your nominating entity.

Please be aware that even if you decide to list EDS as your nominating entity, you still need to have an IEEE member nominate you along with two other references. Your nominator and your references all must be active IEEE members holding Senior Member, Fellow or Honorary Member grade.

For more information on the criteria for elevation to Senior Member, please visit the Senior Membership Portal: http://www.ieee.org/membership_services/membership/senior/index.html .

We strongly encourage you to apply for IEEE Senior Membership to enhance your career. At the same time, you'll be helping EDS. Thank you for supporting IEEE and EDS.

[1]http://www.ieee.org/membership_services/membership/senior/index.html

Jamal Deen
EDS Vice-President of Membership
McMaster University
Ontario, Canada

EDS Membership Fee Subsidy Program (MFSP)

Jamal Deen
EDS Vice-President of Membership

The EDS Membership Fee Subsidy Program (MFSP) enables chapters in low income geographical areas to increase their membership or help launch new IEEE EDS chapters.

We are once again offering the IEEE e-Membership option to compliment the EDS program. With IEEE e-Membership, all memberships and subscriptions are electronic. The rules for the EDS MFSP are as follows:

- This program is available for new and current IEEE/EDS members of your chapter. Please note, if a member has benefited from the EDS MFSP in the past, their request for free membership will be denied.
- Each new member's per capita Gross Domestic Product (GDP) cannot exceed US$13,800 or equivalent (per United Nations Guidelines) for basic membership or US$15,000 for e-Membership.
- IEEE and EDS membership is free for all members covered under this program (EDS will cover the cost of IEEE and EDS membership for up to 15 new/existing members per chapter).
- Five of the fifteen members each year must be new IEEE/EDS members.

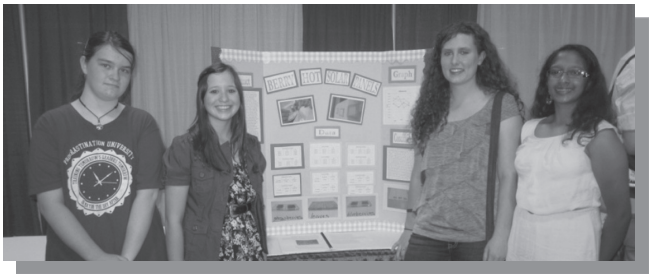
For more information, please visit the EDS membership page, http://eds.ieee.org/membership-fee-subsidy-program.

Jamal Deen
EDS Vice-President of Membership
McMaster University
Ontario, Canada

2013 IEEE PVSC High School Design Competition

The popular high school design competition, sponsored annually by the IEEE Photovoltaics Specialists Conference (PVSC) was held this past June in sunny Tampa, Florida. High school students from the 'Sunshine State' exhibited their latest projects and shared their enthusiasm for solar technology. These rising stars were important participants of the PVSC's exhibit lineup.

BERRY HOT SOLAR PANELS



(l-r) Katie Tew, Victoria Harris Syndey Luzier, Meghana Chapalamadugu. Members of Middletown Senior High School, Girl Scout STEM Troop #1315, West Central Florida. Using berries, this research team tested the efficiency of dyes for solar power systems

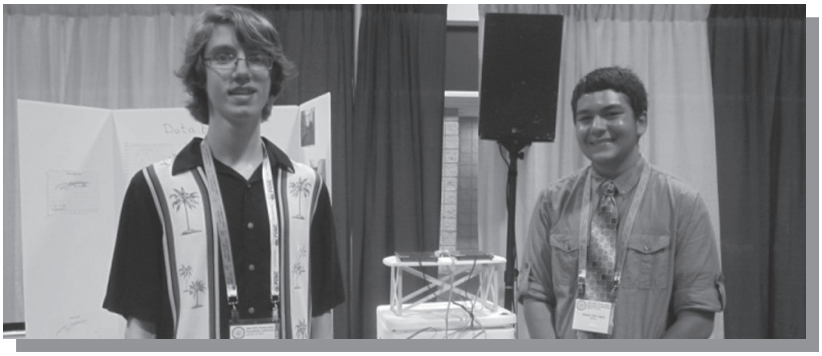
S.A.S.E.E. (Solar and Steam Energy Engine)

(l-r) Nicholas Jimenez, Jonathan Roth and Christine Perrella. The student team from Middletown High School worked with the IEEE Tampa Chapter to create a solar and steam powered engine

CONCENTRATED SOLAR SYSTEM

(l-r) Andrew Noonan and Americo F. Forestieri (Moe Consulting) discussing the system designed by Andrew of Bartow High School

DATA ANALYSIS



(l-r) Aaron Coville and Victor Del Valle. Conducted, in-depth data analysis, to measure effect of clouds on the performance of their solar water filtration system

QuestEDS

Samar Saha
EDS Vice-President of Publications

Interested in knowing why it's not possible to measure the built-in voltage of a PN junction using a voltmeter? Do you need to understand the best way to derive an expression for the average thermal velocity of an electron? Or are you curious about what quantum dots and wires are? The answers to these questions and more are available through the QuestEDS Question and Answer page.

To ask a question not already addressed on the Q&A page, visit www.ieee.org/go/questeds. Technical experts answering the questions posed represent academic, government, and industry sectors.

Questions are grouped into nine technical categories and two general ones. Technical categories cover subject areas like semiconductor and device physics, process technology, device characterization, technology CAD, compact modeling, VLSI interconnects, photovoltaics, and quantum electronics. Subject areas addressed are anticipated to expand in the future. Two other categories address questions pertaining to educational activities and general inquiries about society membership. Within a two week time frame from when the question is asked, an answer is posted online. Incoming questions are handled by an editor-in-chief who ensures that they fall within the technical scope of EDS and that they are adequately answered.

For the answer to this recent submission below, visit http://eds.ieee.org/member-sign-in-form.html?notauth=1. Your IEEE login is required to view the answer page. After authentication you will be redirected to the answer page, where you can select the appropriate topic link.

Samar Saha
EDS Vice-President of Publications
Ultrasolar Technology
Santa Clara, CA, USA

Photovoltaics
Question 059-13 In the dispersion curve of LO Phonon, what is the physical meaning of non zero omega at k = 0. Does omega represent angular frequency here or it is just a measure of energy?

IEEE-UnB Student Branch Wins the IEEE Student Enterprise Award

In 2012, the IEEE student branch of the Universidade de Brasilia (UnB) received six Elenco Snap Circuits® kits from the ED/MTT/EMB Brasilia Chapter. The kits were donated by the IEEE Electron Devices Society's Engineers Demonstrating Science: an Engineer Teacher Connection (EDS-ETC) Program. The student branch launched Projeto Electron to give free classes of fundamentals of electronics to high school students using the donated kits, with the goal of encouraging them to pursue careers in engineering.

Because of the quality of Projeto Electron in relation to the classes in the public schools and thanks to the promotion of many events in Brasilia, the IEEE-UnB Student Branch recently received the prestigious IEEE Student Enterprise Award, in recognition of their exemplary success.

As the winners, the UnB Student Branch was given US$900.00 to sponsor future activities of Projeto Electron. The receipt of this award has given the ED/MTT/EMB Centro-Norte Brasil Chapter international recognition thanks to the quality and effectiveness of its projects. It is hoped that this experience can be replicated by many chapters all over the world.

Luiz Fernando de Andrade Gadêlha
Coordinator of Projeto Electron
Universidade de Brasilia
Brasilia, Brazil

IEEE Journal of the Electron Devices Society

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Please submit your manuscripts for consideration of publications in J-EDS at http://mc.manuscriptcentral.com/jeds. The inaugural issue of the J-EDS was published in January 2013.

The J-EDS publishes original and significant contributions relating to the theory, modelling, design, performance, and reliability of electron and ion integrated circuit devices and interconnects, involving insulators, metals, organic materials, micro-plasmas, semiconductors, quantum-effect structures, vacuum devices, and emerging materials with applications in bioelectronics, biomedical electronics, computation, communications, displays, microelectromechanics, imaging, micro-actuators, nano-devices, optoelectronics, photovoltaics, power IC's, and micro-sensors. Tutorial and review papers on these subjects are, also, published.

The open-access publication, J-EDS is intended to provide the electron devices community:

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IEEE

Regional and Chapter News

USA, Canada & Latin America (Regions 1-6, 7 & 9)

The ISDRS 2013 will be held at the Hyatt Regency Bethesda

2013 ISDRS

–by Zeynep Dilli

The 2013 International Semiconductor Device Research Symposium (ISDRS'13) will be held at the Hyatt Regency Bethesda, Maryland, USA, December 11–13, 2013.

A biennial symposium, ISDRS focuses on exploratory research in electronic and photonic materials and devices. Areas such as novel device concepts, processing technologies, advanced modeling, nanotechnology, nanoelectronics, wide band-gap semiconductors, MEMS materials and devices, oxides and dielectrics, organic and polymer opto-electronic materials and devices, ultra high frequency devices & RF effects, flexible and printed electronics, and high power-high temperature devices are included. The Symposium brings together diverse participants in multidisciplinary areas, and provides a forum for extended personal scientific interaction for engineers, scientists, and students working in the field of advanced electronic materials and device technologies. Among our plenary speakers featured this year are Prof. John Rogers, from University of Illinois at Urbana-Champaign, and Dr. Scott List, of Intel Corporation.

Abstracts from the conference are published online through the *IEEE Xplore Digital Library*. Presenters may optionally submit a full-length manuscript to be considered for publication in a special issue of *Solid State Electronics*. The abstract submission deadline is September 2, 2013.

The conference venue, Bethesda, is a vibrant town in Maryland, within the suburban Washington D.C. Metropolitan area. It is easily accessible by public transportation and from the Washington D.C. Beltway by car. The conference hotel is immediately next to the Bethesda Metro stop and within a lively shopping and restaurant district.

More information on the symposium, the venue, and submissions may be found online at http://www.isdrs2013.org.

~Fernando Guarin, Editor

ED Santa Clara Valley

–by Toshishige Yamada

In February, Dr. G. W. Burr, IBM Almaden, presented "*Towards Storage Class Memory: 3-D crosspoint access devices using Mixed-Ionic-Electronic-Conduction.*" Memory technology is going through a rapid change, as new non-volatile memories (NVM) emerge that complement, augment. He discussed technology to stack multiple layers of NVM crosspoint arrays in 3D.

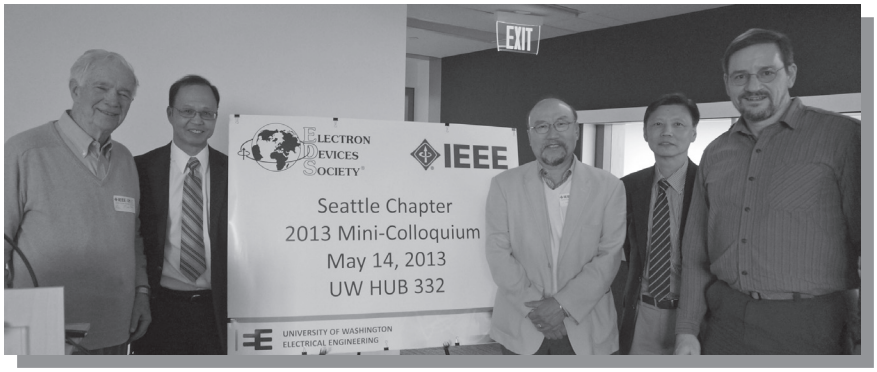
In March, Prof. H.-S. Philip Wong, Stanford, presented "*Electronics Applications of Carbon Nanotube and Graphene*." He discussed the use of carbon nanotube and graphene for various electronics applications including digital logic, sensor circuit, interconnect wires, phase change memory, and metal oxide resistive switching memory.

Dr. Kayes with Alta Devices, at the chapter seminar held in April

In April, Dr. B. Kayes, Alta Devices, presented "*High-Efficiency, Flexible, Thin-Film, III-V Solar Cells.*" He discussed their activities achieving the world record for single-junction solar cells under a non-concentrated AM1.5G spectrum from its previous value of 26.4% to its current value of 28.8%.

In June, Prof. S. Mahapatra, Indian Institute of Technology presented, "*A Complete NBTI DC / AC Model for SiON and HKMG p-MOSFETs.*" He discussed hole trapping and detrapping using a simple empirical formalism, and was able to explain the observed NBTI time evolution during DC stress and recovery.

For further information, please visit our chapter website at, http://www.ewh.ieee.org/r6/scv/eds/index.html.



Seattle MQ Lecturers: Al MacRae, Juin J. Liou, Cary Yang, Paul K.L. Yu, Bruce Darling

ED Seattle

–by Bruce Darling

The IEEE Electron Devices Society (EDS) and the Department of Electrical Engineering at the University of Washington co-sponsored a successful Mini-Colloquium for the EDS Seattle Chapter on May 14, 2013. This event was held in the HUB (Husky Union Building) on the University of Washington Seattle campus. There were 40 attendees in addition to the speakers and organizers and student volunteers, making a total of 54 participants. In addition to the talks, there were two hosted break sessions and a luncheon which provided a venue for fruitful discussions and exchanges of ideas and contacts. The purpose of the Mini-Colloquium was to bring together many of the diverse electron devices community in the Seattle and University of Washington environments and to re-launch the Seattle Chapter of the EDS. The support of this activity by the IEEE EDS and the Department of Electrical Engineering and the IEEE EDS Distinguished Lecturer Program are all gratefully acknowledged. The Mini-Colloquium was organized by Prof. R. Bruce Darling of the Department of Electrical Engineering at the University of Washington.

The Mini-Colloquium featured 3 IEEE EDS Distinguished Lecturers:

- **Prof. Paul K. L. Yu**, Dept. of ECE, U. C. San Diego, La Jolla, California
  A Green Campus and Photovoltaic Research
- **Prof. Juin J. Liou**, University of Central Florida, Orlando, Florida
  Recent Development on Electrostatic Discharge (ESD) Protection of RF Integrated Circuits
- **Prof. Cary Y. Yang**, Santa Clara University, Santa Clara, California
  High-Frequency Characteristics of 1-D Nanostructures

In addition, there were talks from several local device researchers, who represented a sampling of several on-campus research thrusts:

- **Prof. Lih Y. Lin**, University of Washington, Seattle, Washington
  Solution-Processed Quantum Dot Photodetectors
- **Dr. Grant Aivazian**, (Prof. Xiaodong Xu Laboratory) University of Washington, Seattle, Washington
  Optoelectronics of 2D Layered Materials
- **Prof. Marco Rolandi**, University of Washington, Seattle, Washington
  Complementary Bioprotonic FETs with Acid and Base Dopants
- **Dr. Michael Khbeis**, University of Washington, Seattle, Washington
  Recent Activities and Emerging Capabilities at the UW Microfabrication Facility (MFF)

~Adam Conway, Editor

Distinguished Lecturers and attendees at the May 14th ED Seattle Chapter Mini-Colloquium

ED South-Brazil and ED Student Chapter at UNICAMP

–by Jacobus Swart, Fred Cioldin and João Antonio Martino

The eighth Workshop on Semiconductors and Micro & Nano Technology—SEMINATEC—was held on May 2–3, 2013, at the University of Campinas (UNICAMP), Brazil. This annual workshop started in 2005 at UNICAMP and alternates between the metropolitan areas of Campinas and São Paulo. The purpose of SEMINATEC is to promote the interaction among industry, academy, research and development centers, government and students, all looking for real opportunities towards improving semiconductor and micro and nano technologies, research, and education. This year SEMINATEC was organized by the UNICAMP's Center for Semiconductor Components with support and funding from EDS and SSCS South Brazil chapters, EDS and IEEE UNICAMP's student chapters, the OSA student chapter, the Brazilian Microelectronics Society, INCT Fotonicom, The Physics Institute (IFGW/Unicamp), the Center for Information Technology Renato Archer, the Integrated Systems Laboratory (University of São Paulo), and the INCT NAMITEC Science & Technology National Institute.

SEMINATEC 2013 was attended by more than a hundred and forty participants from academia, research institutes, industry and government. Such relatively high attendance reflects the enormous success of its organization, and indicates the substantial and growing interest the workshop has been able rally over the years. This year SEMINATEC's two day intense program was centered around eight overview lectures, two of them by EDS Distinguished Lecturers, one by a SSCS Distinguished Lecturer, one by an OSA Distinguished Lecturer, and four other by lecturers from academia and research institutions:

"*Revisiting MOSFET threshold voltage extraction methods*" by Adelmo Ortiz-Conde, USB, Venezuela (EDS DL); "*Floating body retention time analysis for 1T-DRAM*" by Marc Aoulaiche, IMEC, Belgium; "*Photonics and RF packaging and integration*" by Pentti Karioja, VTT, Finland; "*Nanotechnology to Measure and Manipulate Neural Activity*" by Jacob Robinson, Rice University, Houston, USA (OSA DL); "*2D spatial statistics for microelectronics and materials science*" by Enrique Miranda, Universitat Autonoma de Barcelona, Spain (EDS DL); "*Microelectromechanical Systems in Mexico*" by Horacio Estrada Vázquez, CENAM, Mexico; "*Steep subthreshold swing transistors for low-voltage computing*" by Alan Seabaugh, University of Notre Dame, USA; "*Software Defined and Cognitive Radio Techniques*" by Bram Nauta, University of Twente, the Netherlands (SSCS DL).

In addition to the scientific lectures, five semiconductor companies were invited to give half hour presentations describing their activities and demands for research and human resources to academia and industry in the region. The invited speakers from the companies were: Leandro Profes (HT Micron), André Daltrini (CEITEC), Cleber Figueira (SMART), Clovis Gajo (Semikron), and Jorge Pereira (Padtec).

There was also a Poster Session where thirty-four selected technical papers were presented and discussed. SEMINATEC 2013 included a cocktail reception offered to the participants, as well as a closing Panel Discussion Session on sensors and their applications. More details are available at http://www.ccs.unicamp.br/seminatec2013/

~ Francisco J. García-Sánchez, Editor

SEMINATEC 2013 Lecturers and organizing committee members, from left to right: Enrique Miranda, João Antonio Martino, Adelmo Ortiz-Conde, Pentti Karioja, Horacio Estrada Vazquez, Alan Seabaugh, Marc Aoulaiche, Bram Nauta, Fred Cioldin, Jacobus Swart and Wilhelmus van Noije

Participants of SEMINATEC 2013 at one of the lectures

Europe, Middle East & Africa (Region 8)

ED Scotland

–by Jonathan Terry

To mark its anniversary, the Scottish Chapter of the IEEE Electron Devices Society recently held its first Annual General Meeting at the University of Glasgow's Rankine Building. The Chapter's Chairman, Prof. David Cumming, led discussions on the significant rise in membership and the series of successful events that have been held since last summer, including industrial visits, technical lectures and a mini-colloquium on Microsystems (see the previous July edition of the newsletter).

To help in the coordination of the Chapter, three new officers were nominated: Dr. Gerard Cummins of Heriot-Watt University as Events Officer; Dr.Stewart Smith of the University of Edinburgh as Student Liaison Officer; and Dr. Li Chong of the University of Glasgow as GOLD (Graduates of the Last Decade) Officer.

A number of events are planned for the remainder of 2013, including an industrial visit to ST Microelectronics CMOS Imaging Division in Edinburgh, a membership drive to encourage students at Scottish Universities to join the Electron Devices Society, and a networking event in collaboration with the newly founded Innovation Centre—Sensors and Imaging Systems (IC-SIS). Further details of these and other future events can be found at the Chapter's website by following the link at: http://ieee-ukri.org/chapters.

New Chapter Officers of ED Scotland: Gerard Cummins (Events), Stewart Smith (Student Liaison) and Li Chong (GOLD)

ED Manchester University

–by Emerson Sinulingga

As advertised in July's newsletter, the University of Manchester Student Chapter held an IEEE ED Mini-Colloquium (MQ) entitled *Engineering beyond Lecture Rooms* on Wednesday, June 12, 2013, in the University's Sackville Street Building. At the event, technical talks highlighting work in the field of electronic devices were presented by Mr. Mohammad Aqeeli (University of Manchester), Ms. Tamara Sheret (University of Bedfordshire) and Mr. Adegoke Sikiru (University of Leicester). An invited industrial talk was given by Dr. Jimmy Tan of Cambridge Semiconductor Radio (CSR), and there was also an invited talk on *Intellectual Property Rights* given by Dr. Daniel Syder of the University of Manchester Intellectual Property (UMIP) Unit. A total of 45 students, researchers and academic staff were in attendance.

IEEE students and researchers were invited to submit entries for a poster competition held during the event, and a total of seventeen posters were displayed. Prizes were awarded to Ms. Sheida Faraji in the research category, for her poster entitled "*Novel, High Capacitance Nanocomposite Dielectrics for Low-cost, Flexible Electronics*," and to Mr. Mahmoud Mahfouz in the innovative category, for his poster entitled "*Vision Based Surface Mount Technology Pick and Place Machine.*" The MQ was made possible through the support of the IEEE Electron Devices Society, the University of Manchester's Faculty of Engineering and Physical Sciences Graduate Development Program, the IEEE UKRI Section and IEEE UKRI Graduates of the Last Decade (GOLD).

Dr. Zhirun Hu, Student Advisor to the ED University of Manchester Student Chapter, speaking at their MQ, about the benefits of membership in the IEEE Electron Devices Society

The Student Chapter is also planning future events to celebrate their first anniversary. In the first of these, to be held on October 16th, they will be hosting two EDS Distinguished Lecturers, Werner Weber of Infineon Technologies, Germany and Enrico Sangiorgi of Universita' di Bologna, Italy. Further details and copies of the MQ proceedings can be found on the chapter's website at http://ewh.ieee.org/sb/uk/manchester/.

~Jonathan Terry, Editor

ED Germany

–by Joachim N. Burghartz

The German Chapter of IEEE EDS sponsored the annual spring compact modeling workshop of the MOS-AK/GSA Modeling Working Group, a global compact modeling standardization forum, held April 11–12, 2013. The meeting was supported by Prof. Doris Schmid-Landsiedel and the staff of the Institute for Technical Electronics, TUM, Munich, who is one of the local coordinators

of the ED German Chapter. More than 30 international academic researchers and modeling engineers attended three sessions to listen to 12 technical compact modeling presentations. As in previous years this well-established effort has been coordinated by Wladeck Grabinski at EPFL in Switzerland. The workshop's three sessions focused on common compact modeling actions. Sessions included: (i) How to consolidate and build consistent simulation hierarchy at all levels of advanced TCAD numerical modeling; (ii) Compact/SPICE modeling for Analog / Mixed Signal circuits; and (iii) Corner modeling and statistical simulations.

The MOS-AK/GSA speakers were K.-W. Pieper (Infineon), M. Sylvester (MunEDA), B. Iñiguez (URV), I. Nickeleit (Agilent), L. Heiss (LTE, TUM); T. Schulz (Intel), C. Jungemann (RWTH), M. Brinson (London Metropolitan University), B.-Y. Nguyen (SOITEC), A. Kloes (THM), U. Monga (Intel), and M. Bucher (TUC). The event was accompanied by a series of the software/hardware demos by MOS-AK/GSA industrial partners: Agilent, MunEDA and Tanner EDA. The session technical and software/hardware demo presentations are available for download at: <http://www.mos-ak.org/munich_2013/>.

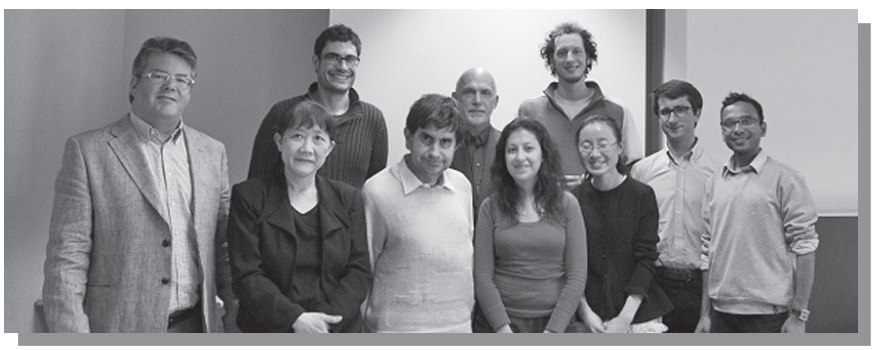
The International Semiconductor Conference Dresden-Grenoble (ISCDG) 2013 is another technical event that will take place in 2013 with support of the German IEEE EDS Chapter. This conference evolved from a regional meeting to an international bi-annual conference with technical co-sponsorship of IEEE EDS and IEEE MTT-S in Dresden in 2011 and, since 2012, in Grenoble every other year. This year's meeting will take place in Dresden on September 26 and 27, 2013. Topics covered include: Integrated Circuit and System Design, More Moore and Beyond Moore Devices Technologies and Architectures, Memory Technologies, More than Moore Technologies, Interconnection and Packaging Technologies, Optical Devices and Photonics, Organic and Flexible Electronics, Characterization, Quality and Reliability, Modeling and Simulation. Details can be found at www.iscdg.org.

CAS/ED Switzerland

–by Shih-Chii Liu

The IEEE CAS/ED Swiss Chapter sponsored a student workshop on

May 29, 2013, at EPFL Lausanne. See also http://www.ieee.ch/chapters/cas-ed/cas-ed-news/2013-05-29/. At this one day workshop, which was organized by the IEEE student branch at EPFL, students from Switzerland presented their recent advances in Circuits and System and Electron Devices. The workshop included talks by two keynote speakers, student speakers, and a demonstration



Some of the participants and speakers at the workshop. Bottom Left: Mathias Bucher, Shih-Chii Liu, Benjamin Iniguez, Elizabeth Buitrago, Yuanhao Bi. Top Left: Josep Maria Margarit, Wladyslaw Grabinski, Aron Szabo, Lucian Barbut (main organizer from the IEEE student branch at EPFL), Anurag Mangla (co-organizer)

of a salamander robot at a concluding outdoor barbeque with both speakers and students.

~Jan Vobecky, Editor

Asia & Pacific (Region 10)

ED/SSC Hong Kong

–by Charles Surya

The IEEE ED/SSC Hong Kong Chapter Successfully organized the 2013 IEEE International Conference on Electron Devices and Solid-State Circuits 2013 (EDSSC 2013), which was held in Hong Kong, June 2–5, 2013. This is the sixth in the series of conferences under the name of EDSSC. The previous meetings were held in 2003, 2005, 2008 (HK), 2009 (Xian), 2010 (HK), 2011 (Tianjin) and 2012 (Bangkok) respectively. EDSSC has its roots in nine meetings, known as the Hong Kong Electron Devices Meeting held yearly between 1994 and 2002. The conference is organized by the IEEE Electron Devices and Solid-State Circuits Hong Kong Chapter, and technically and financially co-sponsored by the IEEE Electron Devices Society. The main goal of this conference is to bring together scientists, engineers and research students from around the world to discuss their most recent advancements in the areas of electron devices and solid-state circuits.

This year, we moved up the schedule of the EDSSC to coincide with the IEEE Electron Devices Society's mid-year Board of Governors meeting. In doing so, we are hoping to make EDSSC to eventually become one of the premier conferences in the field of devices and circuits, to enhance the impact of the EDSSC in the Asia-Pacific region, and to offer added benefits to the members of the IEEE EDS and SSCS. It is gratifying to see that our conference has a truly global participation from 19 countries/regions and covers a broad spectrum of topics related to electron devices and solid-state circuits. We received a record 300+ paper submissions this year, of which 97 abstracts were accepted for oral presentation and 103 for poster presentation. Apart from the oral and poster sessions, we invited Professor Jesus A. del Alamo of MIT, Professor Cor Claeys of IMEC, Professor Charles Sodini of MIT and Mr. Nick Yu of Qualcomm Inc., USA, to present plenary talks on Nanoelectronics, Low-frequency Noise in CMOS, Medical Devices and the Future of Computing respectively. In addition, Professor Juin J. Liou of the University of Central Florida presented a tutorial focusing on the ESD protection of IC circuits. The conference also featured 23 invited talks presented by top experts in the field.

EDSSC 2014 is scheduled to be held in Chengdu next year. Please mark this event on your calendar!

2013 IWJT

–by Yoji Kawasaki

The 13th International Workshop on Junction Technology (IWJT) was held, June 6–7, 2013, at Kyoto University. The purpose of the workshop was to provide an open forum for all engineers and scientists who are working in various areas of junction technologies in the field of semiconductor devices. There were more than 80 attendees, with many famous engineers and scientists from Japan, China, Taiwan, USA, Ireland, Belgium and France.

The technical program of the 13th IWJT consisted of 27 excellent papers, including two keynote speeches from France and Japan; eight invited papers from Belgium, Ireland, China, with 5 submissions from Japan; and seventeen contributed papers (5 from the USA, 1 each from The Netherlands and China, 3 from Taiwan and 7 from Japan).

Attendees of the 2013 IWJT, held at Kyoto University

The papers were categorized into six technical sessions: Device & Advanced Integration, Advanced Doping, Epitaxy & Silicide, Characterization, Power Devices, and Activation & Annealed Defects.

For 2013, the IWJT expanded its scope and invited scientists in the new field for a breakthrough to flat situation. The wide scope increases the number of submitted paper related to CMOS image sensors and newly established session on Power Devices. Precise and clear presentations by invited speakers ranged from introductions to future trends or challenges, allowing attendees to understand the novel device.

The next IWJT will be held, May, 2014 in Shanghai, China.

ED Peking University Student Chapter

–by Runsheng Wang

The ED Peking University (PKU) Student Chapter held a Distinguished Lecture on May 27, 2013, with Dr. Fernando Guarin of IBM Systems & Technology Group, invited to deliver a lecture entitled "*Trends in Technology, Reliability and Qualification of Leading Edge CMOS Technologies.*" Dr. Guarin presented the path to maintaining the advanced CMOS scaling cadence and new reliability limiting factors, with a closer look on hot Carriers, bias temperature instabilities and statistical variations. There were about 30 attendees and after the DL, Dr. Guarin gave a more detailed face-to face discussion with our members and students to share his research experience. The Peking University chapter also held many other events and detailed information can be found on the chapter's website, *http://www.ime.pku.edu.cn/soi/edpku.html*.

ED Taipei

–by Steve Chung

The ED Taipei Chapter held two invited talks in the second quarter of 2013. Dr. Barry P. Linder, from IBM, gave a talk on April 22nd at the National Chiao Tung University, Hsinchu. His talk, "*Improving and Optimizing Reliability in Future Technologies with High-k dielectrics*," presented the three dominant mechanisms, NBTI, PBTI, and TDDB, imposed on the limit of gate oxide scaling. Specialized ring oscillator structures that aid in the understanding of the effect of both PBTI and NBTI on circuit operation were also demonstrated. The talk was well attended by more than 110 participants, including students and professors from the local universities. After the lecture, a guided tour of the campus semiconductor facilities was arranged for Dr. Linder.

The next event on April 26th, with Prof. Shiniji Takagi from the University of Tokyo, discussed "*III-V/Ge CMOS device technologies.*" Recently, CMOS development has been concentrated on the III-V

Dr. Fernando Guarin (front row, 3rd from left) pictured with Dr. Runsheng Wang (2nd from left), the chapter chair, and other members of the Chapter

ED Taipei April 26th, invited talk, (1st row from left) Y. T. Ho, Stella Wen, Ed Chang, S. Takagi (speaker), Steve Chung (seminar host), Yee-Chai Yeo, and participating professors and students

and Ge channels. This is because III-V semiconductors have extremely high electron mobility and low electron effective mass and Ge has extremely high hole mobility and low hole effective mass. Thus, one of the successful CMOS structures can be the combination of III-V nMOSFETs and Ge pMOSFETs. Prof. Takagi addressed the implementation of InGaAs-on-Ge wafers fabricated for integrating InGaAs-OI nMOSFETs and Ge pMOSFETs, and discussed the gate stack and the reliability, as well as the formation of good S/D technologies. His talk was attended by more than 50 students and 10 professors.

~Mansun Chan, Editor

2013 IMFEDK Poster Session

ED Kansai

–by Michinori Nishihara

The ED Kansai Chapter held the 11th International Meeting for Future of Electron Devices, Kansai (2013 IMFEDK) at Kansai University Centenary Memorial Hall, Osaka, Japan, Jun 5-6, 2013, with the theme of "New Challenges for 'Smart' World."

The meeting attracted 131 attendees and was preceded by a tutorial seminar with two distinguished lecturers: 1) "*Fundamentals of GaN Transistors*" by Dr. Yasuo Ono of e-Device; and 2) "*Fundamentals of GaN Transistor Application Technology*" by Dr. Wataru Saito of Toshiba Corporation. The formal program began after the tutorial session with opening remarks by the general chair Prof. Yasuhisa Omura. The two day program featured two keynotes: 1) "*Low Energy Silicon Solution toward Smart and Sustainable Society*" by Dr. Toshiaki Masuhara of LEAP; 2) "*Low-Power Ultrahigh-Speed Wireless Communication with Short-Millimeter-Wave CMOS Technology*" by Prof. Minoru Fujishima of Hiroshima University. There also were two invited papers: 1) "*Evolution of Power Amplifier for Mobile Applications*" by Dr. Satoshi Tanaka of Murata Manufacturing Co.; 2) "*Atmospheric Pressure Processed InGaZnO Thin-Film Transistors*" by Prof. Mamoru Furuta. In addition there were 15 papers in three regular technical sessions and a poster session with 37 posters with topics spreading out to Silicon, Compound, Emerging, and Circuits and Systems. There were many students discussing in front of the posters.

At the end of the meeting the following awards were presented:

- IEEE EDS Kansai Chapter IMFEDK Best Paper Award to Yasufumi Kawai et al of Panasonic Corporation
- IEEE EDS Kansai Chapter IMFEDK Student Paper Award to the following seven persons: Shusuke Yoshimoto (Kobe University), Indra Nur Adisusilo (Osaka University), Kazuya Mukai and Satoru Sasaki (Osaka Institute of Technology), Takayuki Kadonome (Ryukoku University), Daiki Sato

Winners of the 2013 IMFEDK Best Paper and Student Paper Awards

(Kansai University) and Keisuke Kado (NAIST)

The award winners were congratulated warmly by all participants. IMFEDK will continue to encourage and contribute to our student members in the Kansai area by providing opportunities to present their ideas in English, hence extend their technical network to other Asian countries.

We will hold the annual Kansai Colloquium Electron Devices Workshop on October 25, 2013, in Osaka to review major papers published during the last 12 months. It will be presented in Japanese but please visit our homepage to find out more, http://www.ieee-jp.org/section/kansai/chapter/eds/.

~Kuniyuki Kakushima, Editor

Professor Anisul Haque delivering the Distinguished Lecture

ED/SSC Bangladesh

–by A.B.M. Harun-ur Rashid

The IEEE ED/SSC Bangladesh Chapter organized an EDS Distinguished Lecture Program as a part of the IEEE Bangladesh Section student-GOLD-WIE congress held on June 21, 2013 in the Bangladesh University of Engineering and Technology (BUET), Dhaka. The DL talk was delivered by Professor Anisul Haque from East West University on "*High-Mobility Semiconductor MOSFETs for Beyond the Silicon CMOS Technology.*" He addressed the issues of Ge and III-V materials as a potential alternative of widely used silicon and their associated pros and cons, as the trend in CMOS industry kept with the continuous scaling down of devices. The lecture was attended by more than 70 IEEE members from various universities—BUET, RUET, AIUB, IUT, UIU and EWU. An interactive session conducted by Professor Haque had many participants and was very successful.

ED Malaysia

–by P. Susthitha Menon

The IEEE ED Malaysia Chapter held its Annual General Meeting, January, 18, 2013, at the Pullman Putrajaya Lakeside Hotel. Prof. Dr. Nizar Hamidon from Universiti Putra Malaysia (UPM) was elected as the new Chapter Chair and Prof. Dr. Badariah Bais from Universiti Kebangsaan Malaysia (UKM) was elected as the new Vice-Chair. Prof. Dr. Roslina Sidek from Universiti Putra Malaysia (UPM) was elected as the new Treasurer and Prof. Dr. P. Susthitha Menon from the Institute of Microengineering and Nanoelectronics (IMEN) as the Honorary Secretary. IMEN Director, Prof. Dato. Dr. Burhanuddin Yeop Majlis is the chapter advisor.

A Half Day Workshop by Prof. Dr. Shoji Kawahito, IEEE Fellow at Shizuoka University, Japan was organized by the chapter on April, 25, 2013, at Universiti Putra Malaysia.

Prof. Kawahito delivering his talk at Universiti Putra Malaysia

The title of the workshop was Low Power Readout Circuit and it was attended by about 50 participants most of whom were faculty and students. For the year 2013, one of the most important events for the chapter is the bi-annual IEEE Regional Symposium on Micro and Nanoelectronics (RSM2013) to be held at the Holiday Villa Beach Resort, Langkawi Island, Malaysia on September 25–27 2013. This is the ninth RSM organized by the chapter.

From right: Dr. Ming Liu (DL speaker), Dr. Souvik Mahapatra (DL speaker), and Dr. Xing Zhou (event organizer)

ED/Rel/CPMT Singapore

–by Xing Zhou and Yeow Kheng Lim

The REL/CPMT/ED Singapore Chapter organized two Distinguished Lectures (DLs) on July 4, 2013. The first given by Prof. Souvik Mahapatra of the Indian Institute of Technology, Bombay, was entitled "*A Complete NBTI DC / AC Model for SiON and HKMG p-MOSFET,*" and the second, given by Prof. Ming Liu of the Institute of Microelectronics, Chinese Academy of Sciences, was entitled "*RRAM—An Emerging Non-volatile Memory Technology*." The event was co-hosted by the NOVITAS Nanoelectronics Center of Excellence at the School of EEE, Nanyang Technological University, and held in conjunction with the ICMAT conference. We were very fortunate to have these two distinguished speakers, who were also in town to attend the ICMAT.

~M.K. Radhakrishnan, Editor

EDS MEETINGS CALENDAR
(As of 1 August 2013)

The complete EDS Calendar can be found at our web site: http://eds.ieee.org. Please visit.

06 Oct - 08 Oct 2013
2013 European Microwave Integrated Circuit Conference (EuMIC)
Conf Record :30843
Location: Nuremberg , Germany
Contact : Wolfgang Heinrich
Tel : +49 30 6392 2620
Fax :
E-mail: w.heinrich@eumwa.org
Deadline : 14 Jun 2013
www : http://www.eumweek.com

07 Oct - 10 Oct 2013
2013 IEEE SOI-3D-Subthreshold Microelectronics Technology Unified Conference (S3S) (Formerly known as SOI Conference)
Conf Record :30572
Location: Monterey CA , USA
Contact : Joyce Hooper
Tel : 818-795-3768
Fax : 818-855-8392
E-mail: joyce@imf.la
Deadline :
www : http://s3sconference.org/

13 Oct - 16 Oct 2013
2013 IEEE Compound Semiconductor Integrated Circuit Symposium (CSICS)
Conf Record :30122
Location: Monterey CA , USA
Contact : Francois Colomb
Tel : +1 978-684-5435
Fax :
E-mail: francois_y_colomb@raytheon.com
Deadline :
www : http://www.csics.org

13 Oct - 17 Oct 2013
2013 IEEE International Integrated Reliability Workshop (IIRW)
Conf Record :31681
Location: South Lake Tahoe CA , USA
Contact : Jason Campbell
Tel : 301-975-8308
Fax :
E-mail: jason.campbell@nist.gov
Deadline : 10 Oct 2013
www : http://www.iirw.org

14 Oct - 16 Oct 2013
2013 International Semiconductor Conference (CAS 2013)
Conf Record :31015
Location: Sinaia , Romania
Contact : Cristina Buiculescu
Tel : +40 21 269 0775
Fax :
E-mail: cas@imt.ro
Deadline : 01 Jun 2013
www : http://www.imt.ro/cas

24 Mar - 27 Mar 2014
2014 International Conference on Microelectronic Test Structures (ICMTS)
Conf Record :32659
Location: Udine , Italy
Contact : Francesco Driussi
Tel : +39 0432 558295
Fax : +39 0432 558251
E-mail: francesco.driussi@uniud.it
Deadline : 13 Jan 2014
www : http://icmts2014.uniud.it

18 Apr - 18 Apr 2014
2014 IEEE Workshop On Microelectronics And Electron Devices (WMED)
Conf Record :32556
Location: Boise ID , USA
Contact : Jaydeb Goswami
Tel :
Fax :
E-mail: jgoswami@micron.com
Deadline : 17 Feb 2014
www : http://www.ewh.ieee.org/r6/boise/wmed2014/WMED2014.html

22 Apr - 24 Apr 2014
2014 IEEE International Vacuum Electronics Conference (IVEC)
Conf Record :20241
Location: Monterey CA , USA
Contact : Mark Goldfarb
Tel : 212-460-9700
Fax :
E-mail: mgoldfarb@pcm411.com
Deadline :
www : http://

28 Apr - 30 Apr 2014
2014 International Symposium on VLSI Technology, Systems and Application (VLSI-TSA)
Conf Record :32546
Location: Hsinchu , Taiwan
Contact : Jenny Lin
Tel : +886 3-5916705
Fax : +886 3-5820221
E-mail: vlsitsa@itri.org.tw
Deadline : 31 Oct 2013
www : http://vlsitsa.itri.org.tw/

28 Apr - 30 Apr 2014
2014 International Symposium on VLSI Design, Automation and Test (VLSI-DAT)
Conf Record :32530
Location: Hsinchu , Taiwan
Contact : Elodie Ho
Tel : +886-3-5919039
Fax :
E-mail: elodieho@itri.org.tw
Deadline : 31 Jan 2014
www : http://vlsidat.itri.org.tw/

06 Oct - 08 Oct 2014
2014 IEEE Bipolar/BiCMOS Circuits and Technology Meeting - BCTM
Conf Record :31342
Location: Chicago IL , USA
Contact :
Tel :
Fax :
E-mail:
Deadline : 18 Jul 2014
www : http://http://ieee-bctm.org/

13 Oct - 14 Oct 2014
INTERNATIONAL CONFERENCE ON COMMUNICATION & NANO TECHNOLOGY
Conf Record :31570
Location: CHENNAI , India
Contact : Arun prasad
Tel : +919865413635
Fax :
E-mail: pgsrtswj@gmail.com
Deadline : 06 Sep 2013
www : http://WWW.ICCNT-ECE.ORG

19 Oct - 22 Oct 2014
2014 IEEE Compound Semiconductor Integrated Circuit Symposium (CSISC)
Conf Record :31991
Location: San Diego CA , USA
Contact : Douglas McPherson
Tel : +1 613-670-3371
Fax :
E-mail: dmcphers@ciena.com
Deadline : 25 Jul 2014
www : http://www.csics.org

10 Dec - 13 Dec 2014
2014 IEEE 45th Semiconductor Interface Specialists Conference (SISC)
Conf Record :31578
Location: San Diego CA , USA
Contact : Alex Demkov
Tel : +1 512 471 8560
Fax :
E-mail: demkov@physics.utexas.edu
Deadline : 20 Aug 2014
www : http://www.ieeesisc.org/

11 Dec - 19 Dec 2014
2014 IEEE International Electron Devices Meeting (IEDM)
Conf Record :11149
Location: San Francisco CA , USA
Contact : Ms. Phyllis W. Mahoney
Tel : +1 301 527 0900 (Ext.103)
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline :
www : http://

21 Oct - 23 Oct 2013
2013 IEEE International Conference on Microwaves, Communications, Antennas and Electronic Systems (COMCAS)
Conf Record :30834
Location: Tel Aviv , Israel
Contact : Shmuel Auster
Tel : +972 8 857-5982
Fax :
E-mail: auster@ieee.org
Deadline : 01 Aug 2013
www : http://www.comcas.org

27 Oct - 29 Oct 2013
2013 IEEE Workshop on Wide Bandgap Power Devices and Applications (WiPDA)
Conf Record :30678
Location: Columbus OH , USA
Contact : Wendy Flores
Tel : +1 614 688 2065
Fax :
E-mail: floresw@ece.osu.edu
Deadline : 15 Oct 2013
www : http://www.wipda2013.org/

28 Oct - 29 Oct 2013
2013 Third Berkeley Symposium on Energy Efficient Electronic Systems (E3S)
Conf Record :32266
Location: Berkeley CA , USA
Contact : Joephine Yuen
Tel : 510-664-4439
Fax : 510-664-4113
E-mail: joyuen@eecs.berkeley.edu
Deadline : 09 Aug 2013
www : http://www.e3s-center.org/symposium

07 Nov - 09 Nov 2013
2013 International Workshop on Dielectric Thin Films for Future Electron Devices : Science and Technology (IWDTF)
Conf Record :30932
Location: Tokyo , Japan
Contact : Koji Kita
Tel : +81-3-5841-7164
Fax : +81-3-5841-7164
E-mail: kita@scio.t.u-tokyo.ac.jp
Deadline :
www : http://home.hiroshima-u.ac.jp/iwdtf

04 Dec - 07 Dec 2013
2013 IEEE 44th Semiconductor Interface Specialists Conference (SISC)
Conf Record :20912
Location: Arlington VA , USA
Contact : Alexander Demkov
Tel : +1 512 471 8560
Fax :
E-mail: demkov@physics.utexas.edu
Deadline :
www : http://www.ieeesisc.org/

18 May - 21 May 2014
2014 IEEE 6th International Memory Workshop (IMW)
Conf Record :32432
Location: Taipei , Taiwan
Contact : Pei-Ying Du
Tel : +886955-986-685
Fax : +8863-578-9087
E-mail: pennydu@mxic.com.tw
Deadline :
www : http://

27 May - 30 May 2014
International Conference on electron, Ion, and Photon Beam Technology and Nanofrabrication
Conf Record :32742
Location: Washington DC , USA
Contact : Theodore Fedynyshyn
Tel : +1-781-981-7811
Fax : +1-781-981-4983
E-mail: fedynyshyn@ll.mit.edu
Deadline : 31 Jul 2014
www : http://http://eipbn.org/

31 May - 05 Jun 2014
2014 IEEE International Reliability Physics Symposium (IRPS)
Conf Record :20379
Location: Waikoloa HI , USA
Contact : David Barber
Tel : +1 828 898 7001
Fax : +1 828 898 6375
E-mail: dbarbsta@aol.com
Deadline :
www : http://www.irps.org

08 Jun - 13 Jun 2014
2014 IEEE 40th Photovoltaic Specialists Conference (PVSC)
Conf Record :21196
Location: Denver CO , USA
Contact : Richard R. King
Tel : +1 805 558 4576
Fax : +1 818 838 7474
E-mail: rking@spectrolab.com
Deadline : 26 May 2014
www : http://www.ieee-pvsc.org/PVSC40

10 Jun - 12 Jun 2014
2014 IEEE Symposium on VLSI Technology
Conf Record :18214
Location: Honolulu HI , USA
Contact : Phyllis Mahoney
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline :
www : http://www.vlsisymposium.org

19 Apr - 23 Apr 2015
2015 IEEE International Reliability Physics Symposium (IRPS)
Conf Record :31514
Location: Monterey CA , USA
Contact : David Barber
Tel : 1-828-898-7001
Fax :
E-mail: dbarbsta@aol.com
Deadline : 15 Jan 2015
www : http://www.irps.org

10 May - 14 May 2015
The 27th International Symposium on Power Semiconductor Devices and ICs
Conf Record :32084
Location: , Hong Kong
Contact : Bianca Luk
Tel : +852-26987988
Fax :
E-mail: biancaluk@jmatt.hk
Deadline : 09 Mar 2015
www : http://www.ispsd2015.com

14 Jun - 19 Jun 2015
2015 IEEE 42nd Photovoltaic Specialists Conference (PVSC)
Conf Record :32539
Location: New Orleans LA , USA
Contact : Americo Forestieri
Tel : 440-234-1574
Fax :
E-mail: moe4stre@wowway.com
Deadline :
www : http://www.ieee-pvsc.org

07 Dec - 09 Dec 2015
2015 IEEE International Electron Devices Meeting (IEDM)
Conf Record :14937
Location: Washington DC , USA
Contact : Phyllis Mahoney
Tel : +1 301 527 0900 ext. 103
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline : 22 Sep 2015
www : http://www.ieee-iedm.org

14 Jun - 16 Jun 2016
2016 IEEE Symposium on VLSI Technology
Conf Record :18215
Location: TBD TBD , TBD
Contact : Phyllis Mahoney
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline :
www : http://www.vlsisymposium.org

09 Dec - 11 Dec 2013
2013 International Conference on Field-Programmable Technology (FPT)
Conf Record :30984
Location: Kyoto , Japan
Contact : Tomonori Izumi
Tel :
Fax :
E-mail: t-izumi@se.ritsumei.ac.jp
Deadline : 20 Sep 2013
www : http://www.icfpt.org

09 Dec - 11 Dec 2013
2013 IEEE International Electron Devices Meeting (IEDM)
Conf Record :11125
Location: Washington DC , USA
Contact : Ms. Phyllis W. Mahoney
Tel : +1 301 527 0900 (Ext. 2)
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline :
www : http://www.ieee-iedm.org

11 Dec - 13 Dec 2013
2013 International Semiconductor Device Research Symposium (ISDRS 2013)
Conf Record :32803
Location: Bethesda MD , USA
Contact : Agis Iliadis
Tel : +1-301-775-5558
Fax :
E-mail: agis@umd.edu
Deadline : 16 Dec 2013
www : http://www.isdrs2013.org

15 Dec - 18 Dec 2013
2013 25th International Conference on Microelectronics (ICM)
Conf Record :31713
Location: Beirut , Lebanon
Contact : Rafic Younes
Tel : +961 3 31 68 64
Fax :
E-mail: ryounes@ul.edu.lb
Deadline : 11 Oct 2013
www : http://www.ieeeicm2013.org

15 Jun - 19 Jun 2014
2014 IEEE 26th International Symposium on Power Semiconductor Devices & IC's (ISPSD)
Conf Record :20170
Location: Waikoloa HI , USA
Contact : Don Disney
Tel : +1 408 684 5223
Fax :
E-mail: ispsd.disney@gmail.com
Deadline : 08 Mar 2014
www : http://www.ispsd2014.com

18 Jun - 20 Jun 2014
2014 IEEE International Conference on Electron Devices and Solid-State Circuits (EDSSC)
Conf Record :32286
Location: Chengdu , China
Contact : Zhiwei Liu
Tel : +86-28-83201281
Fax :
E-mail: ziv_liu@hotmail.com
Deadline : 31 Mar 2014
www : http://www.edssc2014.com

28 Jul - 31 Jul 2014
IEEE International Nanoelectronics Conference 2014
Conf Record :31843
Location: Sapporo , Japan
Contact : Kazuhiko Endo
Tel : +81-29-861-3857
Fax :
E-mail: endo.k@aist.go.jp
Deadline :
www : http://

14 Sep - 17 Sep 2014
2014 IEEE Custom Integrated Circuits Conference - CICC 2014
Conf Record :18693
Location: San Jose CA , USA
Contact : Melissa Widerkehr
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: melissaw@widerkehr.com
Deadline :
www : http://www.ieee-cicc.org

04 Dec - 06 Dec 2017
2017 IEEE International Electron Devices Meeting (IEDM)
Conf Record :19572
Location: San Francisco CA , USA
Contact : Phyllis Mahoney
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline : 01 Sep 2017
www : http://www.ieee-iedm.org

12 Jun - 14 Jun 2018
2018 IEEE Symposium on VLSI Technology
Conf Record :18216
Location: TBD TBD , TBD
Contact : Phyllis Mahoney
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline :
www : http://www.vlsisymposium.org

09 Dec - 11 Dec 2019
2019 IEEE International Electron Devices Meeting (IEDM)
Conf Record :19573
Location: San Francisco CA , USA
Contact : Phyllis Mahoney
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline : 01 Sep 2019
www : http://www.ieee-iedm.org

16 Jun - 18 Jun 2020
2020 IEEE Symposium on VLSI Technology
Conf Record :18217
Location: TBD TBD , TBD
Contact : Phyllis Mahoney
Tel : +1 301 527 0900
Fax : +1 301 527 0994
E-mail: phyllism@widerkehr.com
Deadline :
www : http://www.vlsisymposium.org

View the Latest EDS Webinar, CMOS Device Scaling—Past, Present, and Future

Yuan Taur

Launched in 2011, EDS's webinar series delivers members live lectures with luminaries from the field of electron device engineering….streaming right to your desktop! Our most recent webinar, **CMOS Device Scaling—Past, Present, and Future** will be presented by Yuan Taur of the University of California, San Diego. Our sincere thanks to Yuan Taur, for devoting his time and expertise to the Society.

Abstract

CMOS technology ushered in the silicon VLSI era over thirty years ago. This tutorial reviews the history of CMOS devices and projects their future prospects. For any given technology node, CMOS performance is limited by the shortest channel length that can be made while maintaining the integrity of transistor action. The development of the MOSFET scale length theory will be tracked from the 1970s to the present, as it evolves from the one-region model for bulk MOSFETs, to the two-region model for dealing with thick, high-gate dielectrics, then to the three-region model for multiple-gate MOSFETs such as FinFETs. It gives powerful guidelines that, along with quantum mechanical considerations, allow the projection of scaling limits for bulk, SOI, double-gate, and nanowire MOSFETs.

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- Physics and Technology of Advanced Solar Cells with Vikram Dalal
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- Emerging Memory with Victor Zhirnov
- Optimize Your Career through Graduate School with Mark Law
- When Medicine meets Engineering—Paradigm Shifts of Diagnosis and Therapeutics with Chih-Ming Ho