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## Contributions Welcome

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

### Newsletter Deadlines

<u>Issue</u>	<u>Due Date</u>
January	October 1st
April	January 1st
July	April 1st
October	July 1st

# IEEE Electron Devices Society Newsletter

## 1997 International Symposium on Compound Semiconductors (ISCS)



The 24th International Symposium on Compound Semiconductors, which is sponsored by IEEE LEOS and EDS, will be held at the Hotel del Coronado in San Diego, California September 7 - 11, 1997. Compound semiconductors are becoming increasingly important in the commercial arena. Wireless communications, fiber optic networks, and consumer products such as satellite TV receivers and CD players are all creating demand for optoelectronic and microelectronic products which cannot be fabricated from silicon. ISCS provides a unique opportunity for researchers from industry and academia to gather and explore issues that are common among all compound semiconductor materials systems, including materials synthesis, characterization, device design and processing, and applications.

ISCS is the pre-eminent conference in the compound semiconductor field. The series was founded in 1966 under the name "Symposium on GaAs and Related Compounds". The current name reflects a broadening of the conference scope to reflect the larger variety of materials which have emerged as important subjects of study. GaAs, which remains the most commercially significant of the compound semiconductors, will be the subject of one of the plenary talks (see next paragraph) and many other presentations. Other III-V

(continued on page 3)

## Your Comments Solicited

Your comments are most welcome. Please write directly to the Editor-in-Chief of the Newsletter at the address given on the back cover page.

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## University of Illinois- Chicago IEEE Student Branch



Oki Villarreal

I have been given the privilege to write the first article representing the University of Illinois at Chicago (UIC). Being president of the IEEE - UIC chapter has certainly been a challenge, but a challenge I was willing to take. My goals for IEEE - UIC were: first, to assist my members in finding jobs and giving them an idea of what the "real world" would be like; second, guiding my members to scholarship sources to help finance their education; and most important, giving the members an opportunity to apply what they have learned by competing in the IEEE Robot Competition. I have also tried to include some entertainment versus all business.

On October 17, 1996 a group of IEEE members toured Tellabs Operations, Inc. located in Lisle and Bollingbrook, Illinois. Tellabs designs, manufactures, markets and services voice and data transport and network access systems that are utilized worldwide by telecommunication companies, government agencies and businesses. They are most famous for their Titan line of SONET based digital cross-connects. Tellabs' CABLESPAN 2300 offers cable vision and telephone service delivery system. Also, their echo cancellors remove the echo on long distance overseas telephone calls.

The day started with a warm welcome from the folks at the Lisle facility. Following was an overview of the company and their products. We were then introduced to their finest Systems, Software, Firmware, Hardware and Testing engineers. Each one covered what their jobs entailed and what a typical day would be like for them. After lunch we traveled to the Bollingbrook facility where we toured the manufacturing plant and were given a NAS product demo. The students were given an opportunity to ask questions and when the tour was completed they had a pretty good idea of what life was like at Tellabs.

The summer is quickly approaching which means companies such as Tellabs will be looking for interns. IEEE sponsored a resume seminar to give students ideas on how to prepare great resumes. The seminar was conducted by one of the Career Service Representatives who specifically deals with the engineering profession. Great tips were given on how to write a powerful resume.

During Engineering Week (February 17-21, 1997), IEEE planned a few events. We hosted a seminar on "Telecommunication Basics - T1 Transmission Theory" given by a Lead Engineer in the NAS Division from Tellabs. The Lead Engineer discussed the basics on telephone transmission both in the past and future and

(continued on page 19)

### EDS ADCOM ELECTED MEMBERS-AT-LARGE

Term Expires:

#### 1997

H.S. Bennett (1)  
J.T. Clemens (2)  
H. Iwai (1)  
J.L. Merz (2)  
K. Tada (1)  
R.J. Temkin (1)  
S. Verdonck-Vandebroek (1)

#### 1998

S. Asai (2)  
A.S. Brown (1)  
T.P. Chow (1)  
M.A. Shibib (1)  
R.D. Sivan (1)  
J.M. Woodall (2)  
C.Y. Yang (2)

#### \*1999

R.G. Adde (1)  
J.J. Brown (1)  
B.F. Griffing (2)  
R.P. Jindal (2)  
J.B. Kuo (2)  
J.K. Lowell (2)  
I. Mojzes (2)  
K. Shenai (1)

Number in parenthesis represents term.

\* Members elected 12/96

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# Upcoming Technical Meetings

## ISCS (continued from page 1)

materials to be covered at ISCS include InP, GaSb, and the exciting GaN field (the subject of another plenary talk). Other materials systems of interest include II-VI compounds such as HgCdTe and ZnSe; as well as IV-IV compounds such as SiC and SiGe.

### Plenary Speakers

The subjects for the plenary talks for this year's Symposium are drawn from two of the most important current topics in today's compound semiconductor industry: the development of shortwavelength light emitters, and the commercialization of GaAs ICs. In the first plenary talk, Shuji Nakamura of Nichia Chemical Industries Ltd. [Tokushima, Japan], will discuss III-V Nitride-based Blue/Green LEDs and Laser Diodes. Dr. Nakamura and Nichia Chemical have been responsible for a number of remarkable achievements in recent years, including the first successful commercialization of GaN-based devices; the first high-brightness blue and green LEDs, and most recently, the first demonstrations of lasing from GaN/InGaN structures. This talk will provide an excellent opportunity for attendees to catch-up with the torrent of new developments which continue to pour from this innovative source.

In the second plenary talk, Lou Tomasetta, President and CEO of Vitesse Semiconductor [Camarillo, CA], will discuss Commercialization of the Semiconductor of the Future. Mr. Tomasetta has successfully steered his company through the ups and downs of the digital IC market to make it the largest independent GaAs fab in the world, and the darling of many Wall Street stock analysts. Given that Vitesse is now poised to become the first high volume user of 6 inch GaAs substrates, this talk should provide a glimpse of the future of the GaAs industry.

### Invited Speakers

In addition to the plenary talks, ISCS will include several invited presentations from leading researchers in the compound semiconductor field. The list includes:

- Photonic Band Engineering - Eli Yablonovitch, UCLA
- Growth and Doping of c-GaN and c-(GaIn)N Films and Heterostructures - O. Brandt, Paul-Drude-Institute

- MOCVD Growth of Group-III Nitrides for High Efficiency MQW LEDs and High Power (MODFETs - Steve Den Baars, UCSB)
- Spin Coherence and Imaging in Magnetic Quantum Structures - David Awschalom, UCSB
- Patterned High-index Substrates as Templates for Novel Quantum-wire and Dot Arrays: (Growth and Potential Applications - R. Noetzel, Paul-Drude-Institute)
- STM of Quantum Device Structures - John Tucker, University of Illinois, Beckman Institute
- STM Imaging of Ordered Dopant Incorporation in GaAsP - M. Koenraad, Eindhoven University of Technology
- Electrical and Optical Properties of Self-Organised InAs Quantum Dots - L. Eaves, University of Nottingham
- Atomic-like Properties of Semiconductor Quantum Dots - S. Tarucha, NTT

### Contributed Papers & Late News Papers

The most important part of the Symposium is the large number of high-quality contributed papers, submitted by research groups around the world. All aspects of compound semiconductors, including growth, processing, devices, and ICs, will be covered. The materials systems to be addressed include all III-V compounds (including nitrides); SiC; wide bandgap II-VI compounds such as ZnSe, ZnS; IV-IV materials such as SiGe; etc. Papers will be presented in the following areas:

Nanoelectronics and Nanophotonics  
Epitaxy and in-situ Processing; Visible Emitters;  
Heterostructure Transistors; Heterostructure Detectors; OEICs; High Power, High Temperature Devices Simulation and Modeling Quantum Devices; Sin-

gle Electron Devices; Devices for Future VLSICs; Devices for Future Wireless Applications Characterization

The proceedings of the Symposium will be published as part of the long-standing series of these meetings.

A limited number of late news papers, reporting very recent results of special importance, will be considered. The deadline for submission of these abstracts is August 30, 1997. For more information, please use the contact information provided for Professor Mike Melloch.

### Accommodations

This year's ISCS conference will be held in beautiful San Diego, California, one of the world's most popular travel destinations. The conference facility is the famous Hotel del Coronado, a picturesque 700-room National Historic Landmark. It is located on the beach on Coronado Island in San Diego Bay. A limited block of rooms at the special ISCS-24 participant have been reserved. Less expensive accommodations are also available at nearby motels. Detailed information will be given in the Advance Program or can be found on the World-Wide Web (WWW).

More information on ISCS-24 can be found on the WWW at the following location: <http://snowmass.stanford.edu/ISCS/>

For further information, please contact: Prof. Mike Melloch, Purdue University 1285 Electrical Engineering Bldg. West Lafayette, IN 47907-1285 USA; TEL:(765) 494-3528; FAX: 765-494-6441; E-MAIL: [melloch@ecn.purdue.edu](mailto:melloch@ecn.purdue.edu)

We look forward to seeing you in San Diego!

Marie Meyer  
Compound Semiconductor Magazine  
St. Paul, MN

## 1997 International Symposium on Semiconductor Manufacturing (ISSM)

The 1997 International Symposium on Semiconductor Manufacturing (ISSM) will be held October 6 - 8, 1997 in San Francisco, California at the Westin St. Francis Hotel on Union Square.

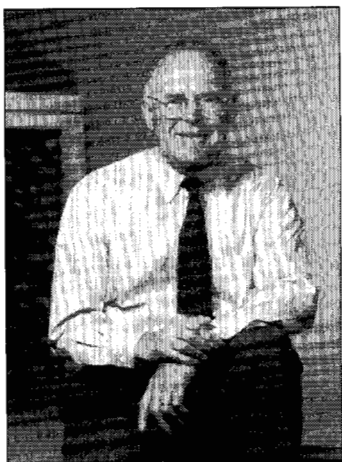
ISSM is a forum of semiconductor manufacturing professionals dedicated to sharing technical solutions and opinions on the advancement of manufacturing science.

The theme for the 1997 symposium is "Manufacturing: The Bridge to the Next Millennium."

ISSM is very proud to announce that Gordon Moore, Chairman of the Board, Intel Corporation will be featured as a key note speaker on the morning of Monday, October 6th. Dr. Moore will discuss the

(continued on page 4)

## ISSM '97 *(continued from page 3)*



Gordon Moore

Photo courtesy of Intel Corporation

past and future of Manufacturing in our industry. Dr. Ulrich Schumacher, President of Semiconductor Group, Siemens will be the keynote speaker on Tuesday, October 7th. Additional keynote speakers will be announced at a later date.

Papers will be submitted by manufacturing professionals, engineers and managers from semiconductor, equipment, materials and facility companies, as well as university researchers and students. The symposium will focus on manufacturing; the systems, methods, and science used to manufacture integrated circuits.

ISSM '97 will continue to address key areas of interest including Factory Management, Equipment, Automation and Information Systems, Factory Design, Environment, Safety and Health, Yield Enhancement, Ultraclean Technology and Process and Material Optimization.

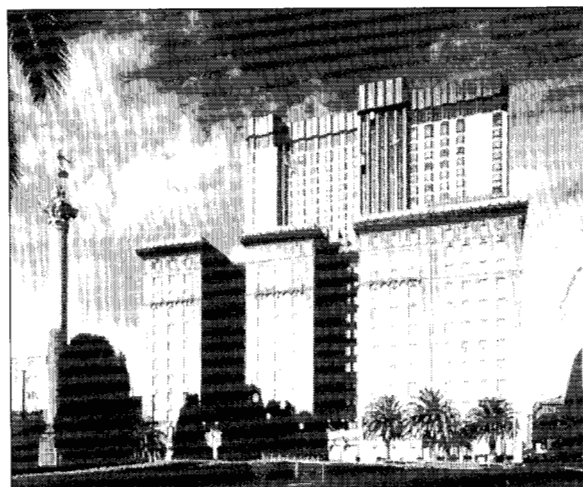
ISSM is sponsored by the IEEE (Electron Devices Society and Components, Packaging and Manufacturing Technology Society) the Ultra Clean Society, and Semiconductor Equipment & Materials International (SEMI), as the symposium focuses on topics of direct interest to all of the above societies.

ISSM is an international symposium, drawing attendance from more than 10 countries worldwide with a strong contingency from the U.S and Japan. Approximately 60 papers will be presented and 20 posters will be displayed. The oral presentations will take place in two tracks over three days. A very thorough and comprehensive review process is employed by the program committee of 15 members, including key members of academia and executives from the leading semiconductor manufacturing companies around the world. Due to an

anticipated record number of abstracts, paper quality is expected to be excellent. The program committee will undergo a very disciplined selection process.

Supplementing the technical sessions will be panel discussions, which provide a more interactive format for considering key issues and trends in the industry. Participants in these discussions are sure to encounter thought provoking dialog.

The Westin St. Francis in San Francisco is an exciting site for this year's symposium, as it is located directly on Union Square and only a brief cab ride (or in some cases a brisk walk away) from many San Francisco attractions, including China Town, North Beach, Fisherman's Wharf, Coit Tower and Golden Gate Park. In addition, San Francisco's Union Square is known for its wonderful shopping and fine dining. The Westin offers old style charm and elegant accommodations for an inviting room rate of \$169 for the Main Building and \$189 for the Tower Building, single or double occupancy. The Bay Area also offers a wide variety of interest to those visiting from out of state or out of the country.



Extended time can be spent in the Napa Valley Wine Country, Lake Tahoe, Yosemite National Park, Monterey or the charming town of Carmel by the Sea.

For registration or general information about ISSM, please contact our web site by searching <http://www.issm.com> or contact Becky Johnston, Conference Manager, ISSM, c/o Meetings Plus, 242 Lafayette Circle, Lafayette, CA 94549; TEL: (510) 284-4040; FAX: 510-284-4161; E-MAIL: [issm97@meetingsplus.com](mailto:issm97@meetingsplus.com).

Michael Splinter  
Intel Corporation  
Albuquerque, NM

## 1997 International Integrated Reliability Workshop (IRW)



Since 1982, the IEEE International Integrated Reliability Workshop and its predecessor, the Wafer Level Reliability Workshop have provided an ideal environment for envisioning, developing, and sharing reliability technology in semiconductor applications. The Workshop features tutorials, formal paper presentations, open poster ses-

sions, moderated discussion group sessions, and special interest group (SIG) meetings. The workshop has developed to focus on a more cross-functional approach to semiconductor reliability engineering by exploring a broad range of topics critically relevant to the semiconductor industry. All workshop activities take place in a relaxed and rustic

setting that promotes an atmosphere of interactive learning. The workshop is co-sponsored by the IEEE Electron Devices Society and the IEEE Reliability Society.

The 1997 workshop will continue to focus on reliability tools and approaches which together define the Building-In Reliability concept, or BIR, in semiconductor manufacturing. The BIR concept places emphasis on an integrated approach to building reliable products, where reliability considerations are integral to various stages of developing a process, designing a product, and manufacturing in volume. The eventual goal is to move reliability assessment forward to points of device conception, process definition, design, and manufacturing implementation. Wafer Level Reliability (WLR) was first introduced by this workshop as a methodology for providing reliability information early in the manufacturing process, and refers to reliability tests performed as close to the source of potential causes of failure as possible. As such, WLR forms a core activity in BIR. While WLR was the initial focus of the workshop, the scope of the Workshop has expanded to include a broader range of reliability engineering topics.

### Technical Papers

Approximately 24 papers will be presented during the Workshop. The Call For Papers requested inputs on the following topics and this will be representative of the papers presented:

1) Contributors to failure: failure mechanisms & reliability models (existing, new, anticipated); sensitivities to device geometry, materials, and manufacturing.

2) Reliability test structures: design, characterization, uses and data analysis; integrated on-chip reliability test systems.

3) Designing-in reliability (circuits, processes, products): methodologies and concepts, modeling, simulation tools, reliability-driven design rules and checkers.

4) Monitors/sensors for reliability learning & control: in processing, assembly, and equipment.

5) Wafer level reliability: test and analysis methodologies; in-line monitors; relation to circuit element and package tests; use and interpretation of WLR data; success stories.

6) Customer product reliability requirements: reliability evaluation methodologies; databases; reporting systems; future reliability targets.

The Call for Papers can be found at the following web site (<http://www.irps.org/irw>). Please note that the deadline for submitting presentation proposals is July 7, 1997.

### Keynote Speaker

Our invited keynote speaker is Dr. David Hodges, speaking on Benchmarking Semiconductor Manufacturing. Dr. Hodges is Distinguished Professor of Engineering at the University of California at Berkeley and co-director of Berkeley's Competitive Semiconductor Manufacturing Program. He was the founding editor of the IEEE Transactions on Semiconductor Manufacturing.

### Discussion Groups

The discussion groups offer an outstanding opportunity to interact with peers on critical reliability topics. These are structured in terms of specific topics as an open forum of discussion where everyone is encouraged to contribute. Held after dinner, discussions are always spirited, and open inputs from different perspectives provide a valuable experience for all. A tentative list of this year's topics are Designing-In Reliability, WLR Implementation, and Customer Reliability Requirements.

### Tutorials

In our continuing effort to enhance the value of the Workshop and to supplement the Technical Program, we are again offering two tutorials on Monday afternoon. This year's topics will be: (1) ESD for Sub-half micron technologies and (2) Yield Enhancement & Modeling.

### Open Poster Sessions

Attendees will be provided the opportunity to present a poster communicating ideas and results on a technical project or issue during the two open poster sessions. Poster display boards will be available, and you are invited to submit a one-page abstract of your poster presentation for inclusion in the workshop proceedings. This is an opportunity to share your work or review work of others in a casual environment where one-on-one exchange of ideas is encouraged.

### Special Interest Groups (SIG)

This is the fourth year the Workshop has sponsored SIGs. The SIG program has

been very successful in fostering collaborative work on important reliability issues, and we look forward to continuing growth and renewal in our SIGs. The SIGs provide a forum for interested participants to remain in contact with each other throughout the year to pursue specific projects.

### JEDEC 14.2 Meeting

The JEDEC 14.2 Wafer Level Reliability Standards Committee meeting will be held at the same location immediately after the Workshop ends on Thursday, October 16, and continues until noon Friday, October 17. The JEDEC meeting is not a part of IRW, but the juxtaposition is very convenient, and many members stay on to attend. JEDEC members, alternates, and guests are welcome. The cost for the accommodations is \$160, which includes Thursday night dinner and lodging and Friday breakfast and lunch. If you have any questions or if you want to become a member of JC-14.2, please call the JEDEC office at (703) 907-7558.

### The Conference Location

The Workshop is held annually at the Stanford Sierra Camp located on Fallen Leaf Lake in the Lake Tahoe region of California. This location has served to provide an optimum environment for sharing the types of innovative reliability and physics breakthroughs that have consistently been presented at the workshop. The schedule is intense from Monday afternoon through Wednesday lunch and extends late into the evenings. We do, however, take Tuesday afternoon off to enjoy the beauty of the area. Most attendees hike, while others play volleyball, sail, canoe or play tennis. We do things together, rather than going in different directions as at most large conferences. This is an invaluable aspect of this Workshop.

### Final Details

The Workshop begins at 2:00 p.m. Monday, October 13, and ends at noon Thursday, October 16. Dress is casual as part of the rustic and working-level nature of the Workshop. The registration fee is \$900 for IEEE members and \$950 for non-members, which includes: meals, lodging, and refreshments at the Stanford

*(continued on page 6)*



## IRW '97 *(continued from page 5)*

Sierra Camp; Presentation View Graphs (provided at the meeting); and the 1997 IRW Final Report (published after the Meeting). For those attending the JEDEC JC-14.2 Meeting, there is an extra accommodations charge of \$160. Please check out the IRW Web Page (<http://www.irps.org/irw>) for more information or contact: Ehren Achee,

Reedholm Instruments, 1997 IRW Communications/Publications Chair; TEL: (512) 869-1935; E-MAIL: [jsreedholm@aol.com](mailto:jsreedholm@aol.com) or James W. Miller, Motorola, 1997 IRW General Chair; TEL: (512) 933-7297; E-MAIL: [rvkg60@email.sps.mot.com](mailto:rvkg60@email.sps.mot.com)

Ehren Achee  
Reedholm Instruments  
Georgetown, TX

## 1997 Cornell Conference on Advanced Concepts in High Speed Semiconductor Devices and Circuits



The Sixteenth Biennial IEEE Cornell Conference on Advanced Concepts in High Speed Semiconductor Devices and Circuits will be held August 4, 5 and 6, 1997 on the Cornell University campus in Ithaca, NY. The conference was established to fulfill the need for a small forum of experts in multidisciplinary fields required for the rapid evolution of high speed microelectronics and optoelectronics. It is one of the few conferences that therefore attracts papers in areas from materials through to systems. A new conference facility is now available providing a convenient setting for oral presentations, poster sessions and industrial exhibits. Ithaca is a major education community with

a population of approximately 30,000 citizens. It lies at the southern tip of Cayuga Lake in the Finger Lakes Region of Upstate New York. Each year Cornell University has provided an excellent backdrop for this conference which is sponsored by the IEEE Electron Devices Society. The conference encourages participation of students through both the informal setting and reduced registration fees. Exchange of ideas and discussion of superior research findings continue to be prevalent characteristics of this conference.

Microwave and mm-wave devices and circuits, optoelectronic devices and circuits, speculative materials, devices and circuit concepts and integrated circuits are the four major areas upon which the conference facilitators have chosen to concentrate. Their intent is to survey the highly important and rapidly changing fields of microelectronics and optoelectronics. Topics of interest within these areas include, but are not limited to: novel materials technologies for devices, wide bandgap materials, device physics, ballistic and hot electron transistors, high speed optoelectronic devices, microcavity devices, Si-based heterostructures, Si/Ge devices, nanometer fabrication techniques, quantum devices and circuits, speculative transistor concepts, measurement techniques for high speed devices, optoelectronic integrated circuits, high speed ICs, integrated antennas, efficient RF circuits, high speed packaging and high power devices & integration. Invited speakers will help lead these thrust areas and set the stage for the contributed papers.

The committee formed to lead the Cornell Conference is comprised of the following active researchers in the fields previously listed:

Conference Chair - Umesh K. Mishra  
Program Chair - Chris Clarke

Program Committee -

M. Adlerstein	P. Bhattacharya
E. Brown	J. East
L. Eastman	T. Jackson
K. Kim	E. Kohn
L. Lunardi	R. Malik
G. Maracas	D. Pavlidis
L. Rea	M. Reed
M. Rodwell	R. Siergiej
M. Tabib-Azar	B. Trew

Prospective authors are invited to submit a 300-word abstract to the Program Chairman, Chris Clarke, 1997 IEEE Cornell Conference, Northrop Grumman STC, 1310 Beulah Road, Pittsburgh, PA 15235-5080; FAX: (412) 256-1877.

The advance registration fee is \$220 for IEEE members or government employees, \$275 for non-members, and \$70 for students. This registration fee includes conference proceedings and tickets to the barbecue (except students). Cayuga Lake, forty miles long and three miles across at its widest point, is ideal for all kinds of water sports, including swimming, boating, water skiing and fishing. Three beautiful state parks, Buttermilk Falls, Robert H. Treman, and Taughannock Falls, are located only a few minutes drive from the city. This year, the breathtaking Taughannock Falls state park is the location chosen for the popular conference barbecue. The park is home to the highest waterfall east of the Rocky Mountains. Bus transportation from the Cornell campus and back will be provided. Residence Hall rooms will be available in the North Campus area. Motels in the vicinity of the campus include a Sheraton Inn (607) 257-2000, Ramada Inn (607) 257-3100, Best Western (607) 272-6100 and the Holiday Inn (607) 272-1000.

Excellent location, superior invited speakers, encouraged student participation and the opportunity to share knowledge with a wide range of colleagues are descriptions which prove the Sixteenth Biennial IEEE/Cornell University Conference encompasses everything necessary for a successful and fruitful exchange of information.

Umesh K. Mishra  
University of California  
Santa Barbara, CA

## Society News

### EDS Officer & AdCom Election Results & Profiles

On December 8, 1996, the EDS AdCom held its annual election of officers and members-at-large. The following are the results of the election and brief biographies of the members-at-large.

#### I. Officers

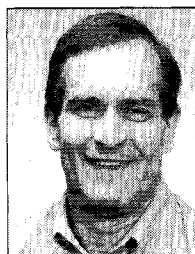
The following individuals were re-elected for a one-year term beginning 1/1/97:

President: Louis C. Parrillo, Motorola, Inc.  
 Vice President: Bruce F. Griffing, General Electric Company  
 Treasurer: Lucian A. Kasprzak, Sterling Diagnostic Imaging, Inc.  
 Secretary: James L. Merz, University of Notre Dame

#### II. AdCom Members-at-Large

A total of eight persons were elected to three-year terms (1997-1999) as members-at-large of the EDS AdCom. Five of the eight individuals were re-elected for a second term. The backgrounds of the electees span a wide range of professional and technical interests.

#### Second Term Electees:



BRUCE F. GRIFFING is the Manager of the Industrial Electronics Lab at GE Corporate Research and Development. He received a B.S. degree in Physics from Miami University in 1972, and a Ph.D. from Purdue University

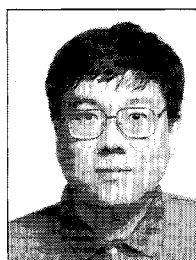
in 1979. He joined the GE Research and Development Center in 1979, and has worked on MOS device physics, optical lith-

ography, CMOS process development and active matrix displays. He presently manages a group responsible for imaging detectors for medical and NDE applications. He was Chair of the IEDM and was the EDS Meetings Chair from 1991 - 1996.



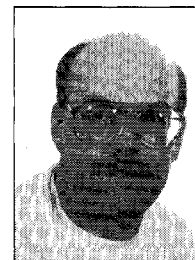
RENUKA P. JINDAL joined Bell Laboratories at Murray Hill, NJ, after graduation in 1981. He became a Distinguished Member of Technical Staff in 1990 and joined the Bell Labs location in Princeton, NJ in

1994. During his tenure at Bell Labs, Renuka has produced ground breaking work on topics including noise behavior of MOS devices, physics of carrier multiplication, signal detection, optoelectronic integration, novel device structures, high speed analog RF ICs, RF component modeling, RF testing and DFM. He is a member of the ABET accreditation team for evaluating electrical engineering programs in the US. He is currently Editor-in-Chief of *IEEE Transactions on Electron Devices* and an elected Fellow of the IEEE.



JAMES B. KUO was born in Taiwan in 1956. He received a BSEE degree from National Taiwan University in 1977, an MSEE from Ohio State University in 1978, and a Ph.D. in EE from

Stanford University in 1985. Since 1987 he has been with National Taiwan University, currently as a professor. His research is on modeling bipolar/CMOS devices for VLSI circuits. He has authored two books: *CMOS Digital ICs* (McGraw-Hill, Taipei, 1996), and *BiCMOS Digital ICs* (McGraw-Hill, Taipei, 1996). He is the recipient of the 1995 ROC NSC Outstanding Research Award. He serves as an associate editor for the *IEEE Circuits and Devices Magazine* and as a technical program committee member for the Modeling and Simulation program subcommittee of the IEDM.



JOHN K. LOWELL received a Ph.D. in Applied Physics from the University of London. He has held technical and managerial assignments for Northern Telecom, United Technologies, Texas Instruments, Mostek

Corporation, British Telecom/Dupont Technologies, and Advanced Micro Devices. Presently, he is a Strategic Technology Manager for the Thermal Process & Implant Division of Applied Materials. He has also been a Professor in the University of Texas system, and at Texas Tech University, in addition to holding several Consulting Professorships at Harvard and other major universities. Dr. Lowell is currently a Visiting Scholar at the NSF Center for the Synthesis, Growth and Characterization of Electronic Materials at the University of Texas at Austin. His scientific interests include the surface chemistry of electronic materials, optical diagnostics of semiconductors, defects induced from thermal processing, metallic and organic contamination in semiconductors, and optical spectroscopy. He has authored or co-authored over 100 papers, holds six patents, and has seven patents pending.

Dr. Lowell is a Senior Member of the IEEE, a Distinguished Lecturer of the EDS and is Vice-Chairman of the American Physical Society (Texas Chapter). In the past, he has also been a member of the AdCom of the IEEE Circuits & Systems Society and the Lasers and Electro-Optics Society (LEOS).

(continued on page 8)

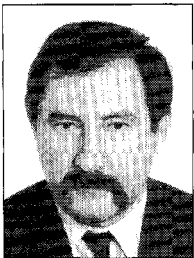
### EDS Chapter Subsidies for 1998

Requests for 1998 subsidies from EDS chapters are due on August 1, 1997. Last year, the EDS AdCom awarded funding to 33 chapters, with most amounts primarily ranging from \$250 to \$1,000. In April, Chapter Chairs were sent an e-mail notifying them of the current funding cycle. A list of guidelines was included with each e-mail. In general, activities which are considered fundable include, but are not limited to, membership promotion, travel

allowances for invited speakers to chapter events, and support for student activities at local institutions. Subsidy requests should be sent via e-mail, fax or mail to the EDS Executive Director, William F. Van Der Vort. His contact information is included on page 2. Final decisions concerning subsidies will be made by the EDS Regions/Chapters Committee in early October. Subsidy checks will be issued by early December.

## AdCom (continued from page 7)

He most recently was awarded a technical achievement award from the Central Texas Chapter of LEOS. For the past ten years, he has also been the Associate Editor-in-Chief of the IEEE Division I *Circuits & Devices Magazine* and has been its Guest Editor twice. He is also a member of the MRS, Sigma Xi and the Texas Academy of Sciences.



IMRE MOJZES is a professor of the Department of Electronic Technology at the Technical University of Budapest and Scientific Director at the Z. Bay Foundation of Applied Research, Institute of Materials Science and Technology. He

received a diploma in EE from the Moscow Power Institute in 1972, a Ph.D. in 1979 and Dr. of Science Engineering in 1988, both from the Hungarian Academy of Sciences. He was with the Research Institute for Technical Physics of the Hungarian Academy of Sciences 1973-91 and part-time lecturer at Roland Eotvos University of Budapest 1978-88. He is the head of the Thin Films Division of the Roland Eotvos Physical Society, and head of Electron Device Division of the Scientific Society for Telecommunication. His current research interests are in III-V semiconductor materials and devices, ohmic contacts, reliability, quality assurance and sensors.

### New Electees:



ROBERT G. ADDE received the doctorates-sciences from the University Paris-South, Orsay, France in 1966. He was MTS at Bell Telephone Laboratories, Murray Hill, NJ 1967-68. He then created and headed a

research group at the Institute of Electronics, University Paris-South, Orsay until 1990. He developed research programs in superconducting electronics, and more recently in semiconductor device electronics. His present interests are in spectroscopic investigations and physical modeling of III-V and IV-IV devices for high frequencies and fast applications and the influence of temperature. He is the author or co-author of over 150 refereed technical publications. Dr. Adde is a Research Director at National Scientific Research Center (CNRS) and was awarded the CNRS Silver Medal in 1982. Between 1985 and

1991, he was in charge of research activities in Electronics, Optoelectronics and Optics at the CNRS Direction of the Engineering Sciences in Paris. In 1989, he was the founder of the IEEE MTT France Chapter and in 1994 the founder and chairman of the joint IEEE ED/MTT France Chapter.



JULIA J. BROWN has been involved in III-V semiconductor electronic and photonic device research over the past 13 years. She received a B.S. in Electrical Engineering from Cornell University in 1983 and a Ph.D. in Electrical Engineering/Electrophysics from University of Southern California in 1991. After her undergraduate studies at Cornell, she worked at Raytheon Company and then AT&T Bell Laboratories before returning to graduate school. She is an author of over 60 publications and presentations on III-V Semiconductor Device Design and Process Development and has 1 patent issued. She is presently the manager of the III-V Processing Research Dept. at Hughes Research Laboratories where she is responsible for advanced process development and yield enhancement of InP-Based HEMTs, GaAs-Based pHEMTs and InP-Based HBT ICs for RF, digital and optoelectronic system insertion applications. She is also actively involved in the IEEE serving on the IEEE Women in Engineering (WIE) Committee for over 2 years and co-founding the IEEE Student-Teacher and Research Scientist (STAR) Mentoring Program.



KRISHNA SHENAI is an Associate Professor of Electrical Engineering and Computer Science and director of the Center for High-Frequency ASIC Design and Manufacturing at the University of Illinois at Chicago, Chicago, IL. He earned his Ph.D. degree in electrical engineering from Stanford University, Stanford, CA, in 1986. He has held senior staff positions at COMSAT Labs, General Electric Corporate Research and Development Center, and Intel Corporation. Dr. Shenai has made significant contributions to the development and application of state-of-the-art ultralow noise cryogenically cooled millimeter wave amplifiers and GaAs MMICs for broadband satellite

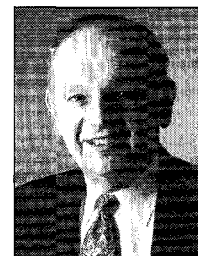
communication, high-speed GaAs digital IC technologies, power MOS technologies, and high-speed low-power scaled BiCMOS logic technologies. His current teaching and research programs are in power semiconductor devices and integrated circuits, low-power electronics, submicron VLSI technologies, semiconductor CAD, and semiconductor manufacturing science and technologies. He is the author or co-author of over 150 refereed technical publications of which over 70 are in international journals. He has been awarded with 8 patents. Dr. Shenai is the co-author of a Best Student Paper award presented at the 1995 IEEE BCTM.

Dr. Shenai has served on the technical program committees of numerous IEEE conferences including IEDM, IRPS, ISPSD, DRC, BCTM and Integrated Reliability Workshop and is the General Chairman for the 1996 IEEE BCTM. He is an Editor of *IEEE Transactions on Electron Devices*, Editor-in-Chief of the *Electron Devices Society Newsletter*, and has served as a Guest Editor of three Special Issues of *IEEE Transactions on Electron Devices* and the *IEEE Journal of Solid-State Circuits*. Dr. Shenai is the author of *VLSI Metallization: Physics and Technologies* (Artech House, 1990) and is the co-editor of three other books. He is a Senior Member of IEEE and a Distinguished Lecturer of the IEEE Electron Devices Society. In 1994, he was elected as a Fellow of the Institution of Electrical and Telecommunications Engineers (IETE) of India.

W. Dexter Johnston, Jr.  
Lucent Technologies Inc.  
Murray Hill, NJ

## EDS Members Win 1997 IEEE Medals and Service Awards

Four EDS members will be among the recipients of IEEE Medals and Service Awards, to be presented at the 1997 IEEE Honors Ceremony, to be held in late June in Cleveland.



George H. Heilmeier

George H. Heilmeier will receive the IEEE Medal of Honor "for discovery and initial development of electro-optic effects in liquid crystals." Heilmeier is Chairman and CEO of Bellcore, Morristown, NJ, USA. Prior to



joining Bellcore in March, 1991, he was Senior Vice President and Chief Technical Officer of Texas Instruments, Inc. He holds a Ph.D. degree in solid-state electronics from Princeton University, and honorary degrees from Stevens Institute and the Israel Institute of Technology (The Technion).

Dr. Heilmeier joined RCA Laboratories in 1958, working on various electronic and electro-optic devices, and became head of Solid-State Device Research in 1966. His work with electro-optic effects in liquid crystal led to the first liquid-crystal displays for calculators, watches, computers and instrumentations.

Dr. Heilmeier has received numerous awards, including the prestigious Japanese Communications and Computers Prize (1990), three major IEEE awards (Sarnoff, Founders, and Philips), the National Medal of Science (1991), National Academy of Engineering Founders Award (1992), and the John Scott Award for Scientific Achievements (1996) from the city of Philadelphia. He is a fellow of IEEE.



David A. Hodges

David A. Hodges will receive the IEEE Education Medal "for innovative teaching of microelectronics, and pioneering education in semiconductor manufacturing." Dr. Hodges is the Daniel M. Tellep Distinguished Professor of

Engineering at the University of California at Berkeley, CA, USA. He holds a Ph. D.

degree from UC Berkeley. Prior to joining UC Berkeley in 1970, Dr. Hodges worked at Bell Telephone Laboratories at Murray Hill and Holmdel, NJ.

Since 1970, Professor Hodges has been active in teaching and research on microelectronics technology and design. With colleagues he developed Berkeley's electrical engineering courses on bipolar and MOS digital integrated circuits. With H.G. Jackson, he co-authored the McGraw-Hill textbook "Analysis and Design of Digital Integrated Circuits." Since 1984, his research has centered on semiconductor manufacturing systems. Since 1991, he and Professor R.C. Leachman have led Berkeley's interdisciplinary research program on Competitive Semiconductor Manufacturing, the first US academic program of its kind.

Dr. Hodges (with R.W. Brodersen and P.R. Gray) received the 1983 IEEE Morris N. Liebmann Award for pioneering work on switched-capacitor circuits. He is a Fellow of IEEE and of the American Association for the Advancement of Science, and a member of the US National Academy of Engineering.



Robert A. Rivers

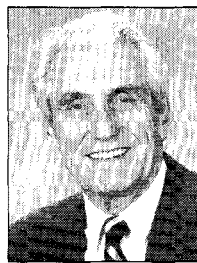
Robert A. Rivers will receive the IEEE Haraden Pratt Award "for leadership and service in the professional and technical activities of the Institute." Mr. Rivers is the president of Aircom, Inc., Union, NH, USA. He graduated from

MIT in 1953 with a BSEE degree. Since 1954, he has been doing research, devel-

opment, design and manufacturing of microwave products.

Mr. Rivers has been very active in IEEE related activities, including being vice-chairman of the MIT student chapter, secretary-treasurer, vice-chairman and chairman of the Boston section Microwave Theory and Techniques chapter. He was a member of MTT AdCom for 15 years and served MTT in various capacities, including being its secretary-treasurer, vice president and president. He was elected to the IEEE Board of Directors and served for two years. He was a member of numerous Institute committees, including President Tanner's Long Range Planning Committee, the Educational Activities Board, the Ethics Review Committee. Presently, he is a member of the Tellers five-year review committee. In addition, he was a founder of Professional Activities and a creative leader in the development of its programs.

Mr. Rivers is a Life Fellow of IEEE. He received the Centennial Medal, USAB Citation of Honor, and the USAB Professional Achievement Award.



Friedolf M. Smits

Friedolf M. Smits will receive the IEEE Richard M. Emberson Award "for outstanding service to the Institute in technical activities, electronic communications, and publications management and finance."

Dr. Smits is laboratory director (retired), IC Masks and Packaging, AT&T Bell Laboratories, Allentown, PA., USA. He received his Ph.D. degree in physics in 1950 from the University of Freiburg, Germany.

Dr. Smits joined Shockley's group at Bell Laboratories in 1954. From 1962 to 1965, while on leave from Bell Laboratories, he managed the radiation physics department at Sandia Corporation, Albuquerque, NM. After returning to Bell Laboratories, he held a number of management positions relating to development of MOS/LSI memories, bipolar LSI, IC masks and packaging.

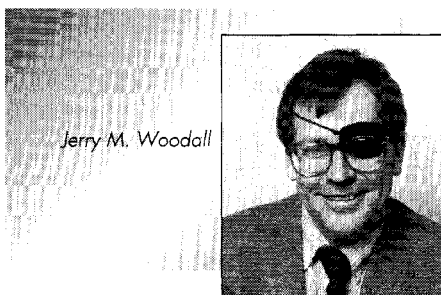
Dr. Smits has been very active in IEEE related activities. From 1980 to 1987, he was a member of AdCom and treasurer of EDS. Since his retirement in 1986, he devotes much of his time to IEEE activities. Specifically, in 1988 and 1989, he was Director, Division I, and since then he has served in many different capacities within

(continued on page 10)

## Woodall Elected 1998 President of AVS

Jerry M. Woodall, the EDS Educational Activities Chair, was recently elected to be the President of the American Vacuum Society (AVS) for 1998. He is currently serving a one-year term as the AVS President-Elect.

Jerry is Purdue University's Charles William Harrison Distinguished Professor of Microelectronics. He holds a BS in metallurgy from MIT and a PhD in electrical engineering from Cornell University. In 1960, he began working at Clevite Transistor Products in Waltham, Massachusetts, and two years later he joined IBM in Yorktown Heights, New York. At IBM, Jerry first served as a research staff member and later an IBM fellow. In 1993, he accepted a position at Purdue University. An expert in



Jerry M. Woodall

exploratory semiconductor materials and novel devices, Jerry has recently been working on the molecular beam epitaxial growth of III-V materials and devices, including metal contacts and doping studies.

The EDS AdCom would like to congratulate Jerry and wish him the best in leading AVS.

## Medals and Awards

(continued from page 9)

the Technical Activities Board and the Publications Activities Board. Presently, he is Vice President for Publications Activities.

Dr. Smits is a Life Fellow of IEEE. He received the 1994 EDS Distinguished Services Award.

*Tak H. Ning  
IBM Research Center  
Yorktown Heights, NY*

## Call for Nominations - EDS AdCom

The Electron Devices Society invites the submission of nominations for election to its Administrative Committee (AdCom). Presently, the AdCom meets twice per year and is composed of 22 members. Seven members will be elected this year for a term of three years, and a maximum of two consecutive terms is allowed. In 1997, the election will be held after the AdCom meeting on Sunday, December 7th. Electees begin their term in office on January 1, 1998.

Nominees are being sought to fill the slate of candidates. Nominees may be self-nominated, or may be nominated by another person; in the latter case, the nominee must have been contacted and have agreed to serve if elected. Any member of EDS in good standing is eligible to be nominated. As another condition for nomination and election, a nominee must be willing to attend the two annual AdCom meetings.

Please send your nominee's name, address, and supporting information to the EDS Executive Director, W.F. Van Der Vort (see page 2 for contact information) in time to be received by the deadline of October 24, 1997. It is very desirable that submissions include a biographical summary in a standard two-page format. The EDS Executive Office can provide you with an example of the format. If you have any questions regarding the nomination requirements or process, feel free to contact the Nominations and Elections Chair, W. Dexter Johnston, Jr. (see page 2 for contact information).

## EDS Administrative Committee Election Process

The Members-at-Large (MAL) of the EDS AdCom are elected for staggered three-year terms, with a maximum of two consecutive terms. The 1993 Constitution and Bylaw changes mandated increasing the number of elected MALs from 18 to 22, and required that there be at least two members from both IEEE Region 8 (Europe, Mid. East & Africa) and Region 10 (Asia & Pacific). It also required that there be at least 1.5 candidates for each opening. From 1994 to 1996, seven, seven and eight positions were filled, respectively. In 1997, seven positions will be filled, as the three year-cycle will start over.

The election procedure begins with the announcement and Call For Nominations in this Newsletter and IEEE Electron Device Letters. 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 in a standard format. Nominations are closed around the end of October, and the biographical resumes are distributed to the 'full' voting members of AdCom prior to the AdCom meeting. Nominees are urged to attend the December AdCom meeting, and the election is held after the conclusion of the meeting.

A continuing flow of new AdCom members who are interested in working for the improvement of the Society and its related technical areas is key to the continued development of EDS and the field of electron devices. Those interested in the field, the Society, and its operations are encouraged to attend AdCom meetings, become involved in Society activities, and to consider running for election to AdCom.

## EDS Home Page Update

Since the debut of the Electron Devices Society's home page in January 1995, it has expanded rapidly to include both detailed information about EDS, as well as links to many other sites of interest. Among the new links that have been added in the last year are the EDS Newsletter and the 'all' electronic journal, Transactions on Technology Computer Aided Design (TCAD), which can be accessed through the EDS PERIODICALS sub-page. In this same section, it is also possible to preview upcoming issues of most of the Society's journals through a link to the IEEE publications preview. The meetings calendar, which is accessed directly from the home page, provides location and contact information for all of the conferences and workshops that are sponsored or co-sponsored by EDS. It also provides an avenue for organizers to add a link to their own home page to give further information on their events. Currently, about one quarter of the meetings listed take advantage of this opportunity. Members and prospective members can contact EDS using the automatic e-mail form under the "Membership & Publications" options to apply for membership, to sub-



*Lisa G. Dron McIlrath*

scribe to a periodical, or to send comments and questions to the staff office. About 12—15 inquiries are received each month in this manner.

Overall, the home page has been a great success for communicating with our current Society members and for attracting new members. Since a counter was added in December 1995, over 10,000 accesses to the site have been logged (through March 1997). The EDS home page address (URL) is <http://www.ieee.org/society/eds/>. It is managed and edited by the Electron Devices Research Group at Northeastern University, with Prof. Lisa McIlrath ([lgdm@ece.neu.edu](mailto:lgdm@ece.neu.edu)) as the main editor. Visit it soon.

*Lisa G. Dron McIlrath  
Northeastern University  
Boston, MA*

## Journal of Technology Computer Aided Design (TCAD)

The *IEEE Transactions on Semiconductor Technology Modeling and Simulation* (The TCAD Journal) is an all new electronic journal that the EDS society approved a little over one year ago. The journal is completely on-line, without a paper backup. All members of the IEEE have free access to the journal at <http://www.ieee.org/journal/tcad/>. Paul Losleben's research group at Stanford University has provided necessary support in the last year as the journal started, and Mark Law is the inaugural editor. Several papers have been accepted as part of a special issue devoted to the Simulation of Semiconductor Processes and Devices conference held last fall in Tokyo.

The TCAD Journal is an archival quality, all electronic journal devoted to issues in modeling and simulation of semiconductor devices, processes, and circuits. This journal is unique in the IEEE hierarchy of journals in both content and form. The content allows consolidation of subareas of several other journals and gives TCAD a single home for many of the cross-disciplinary activities that comprise the research in the field. Being all electronic, the journal provides the TCAD community with the opportunity to use all the mechanisms of this new media including color graphics, hyperlinks, animation, and

sound in new and novel ways to describe research advances.

The content of the journal is held to the same high standards as for the traditional IEEE journals. Editors solicit expert reviews of the papers from multiple sources to evaluate the originality and importance of the work. Articles submitted to this journal must not have been previously published in an archival journal, and articles accepted here should not be submitted to other journals. The intent of this journal is to provide the TCAD community with their own journal consistent with the high standards of publication in existence for other IEEE sponsored transactions.

Authors are encouraged to submit papers in the full range of modeling and simulation applicable to semiconductor technology development. This includes papers on front-end and back-end of the line processing, equipment modeling, models for manufacturing and control, device modeling, and circuit simulation. Papers in these areas can range from innovations in algorithms, data structures and numerics, experimental characterization and parameterization of models, new model development and implementation, comparison of models, and case studies of models used in the technology development. This list is only partial, and

papers are encouraged in all areas of modeling for technology development. Questions about the appropriateness of a particular paper should be directed to one of the editors.

Authors are encouraged to exploit the capabilities of all-electronic publication by using animation, sound, and hypertext in the articles. We encourage and solicit articles that make exciting use of the medium for displaying research results. As examples, animation could be used to show structure evolution during processing, simulations can be run with reader inputs, data can be downloaded to the reader's computer for additional analysis, and hypertext links can be used to allow access to the full derivation of results. The possibilities are quite exciting for better communication of results, and we strongly encourage authors to make use of the capabilities.

For more information, the home page for the TCAD Journal is located at <http://www.ieee.org/journal/tcad/>.

Mark Law  
University of Florida  
Jacksonville, FL

Paul Losleben  
Stanford University  
Stanford, CA

## 1997 Issues of ED Letters & ED Transactions are Available on the WEB!

EDS is participating in the IEEE project to disseminate transactions, journals and letters publications on a secure World-Wide Web site for society member subscribers. The site address is: <http://www.opera.ieee.org>. The project, dubbed "OPERA" (On-Line Periodicals and Research Area), allows *Electron Device Letters* (EDL) and *Transactions on Electron Devices* (T-ED) to be available to the current EDS member subscribers of the corresponding print or microfiche versions. Each issue is available on-line on the same date that the print version is mailed and will remain on the Web for a period of six months. If you are a subscriber to EDL or T-ED, you can obtain immediate access to the journals via the above URL address. The service has been available since January 1997 and has been very well received by the EDS members who have used it.

We would like to enhance this initiative in the near future by offering subscribers the option of receiving the on-line version and a CD ROM in lieu of the print version or as an additional service to members.

We would appreciate any suggestions on improving the service or on how you would like us to offer CD ROM versions of the journals. Please send comments to [s.hillenius@ieee.org](mailto:s.hillenius@ieee.org).

Steven J. Hillenius  
EDS Publications Chair  
Lucent Technologies, Inc.  
Murray Hill, NJ

## Regional and Chapter News

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

#### Activities in Region 1 (Northeastern USA)

Two conferences are slated for Region 1 - The 12th Biennial University Government Industry Microelectronics Symposium, July 20-23, 1997, and the new Intelligent Transportation Systems Conference (ITSC), November 9-12, 1997.

The 12th Biennial University/Government/Industry Microelectronics Symposium will be held at Rochester Institute of Technology, Rochester, New York, and its main focus is to bring together university, government and industry professionals interested in the promotion of microelectronics education and research. Topics of the Symposium cover: industry-university interaction, government-university research programs, university courses, microelectronics research projects, and microelectromechanical systems (MEMS). The General Chairman of the Symposium is Dr. Lynn Fuller, Motorola Professor and Head of Microelectronics Engineering, Rochester Institute of Technology and can be reached at: 82 Lomb Memorial Drive, Rochester, NY 14623-5604; TEL: (716)475-2035; FAX: (716)475-5041; E-MAIL: LFFEEE@ritvax.isc.rit.edu; Website: <http://www.rit.edu>.

The new Intelligent Transportation Systems (ITS) will be held at the Boston Park Plaza Hotel in Boston. The conference incorporates two previous conferences: Vehicular Navigation and Information Systems (VNIS) and Intelligent Vehicles (IV). It covers all aspects of surface transportation and transportation systems integration. Leading edge advances in sensors, information systems, simulations and communications are emphasized with international paper submissions with about one half of the papers submitted from overseas (about 25% from Europe and 20% from Southeast Asia). In addition, there will be about 25 exhibits and several tutorials (offered on Nov. 9, one day before the technical sessions). For more information, contact: Robert L. French, Publicity Chair, ITSC'97, TEL: (817) 731-2711; FAX: (817)731-3181;

E-MAIL: [r.french@ieee.org](mailto:r.french@ieee.org), Website: <http://www.ieee.org/itsc/itsc97>. Registration information is also available from the IEEE Boston Section at: 255 Bear Hill Road, Waltham, MA 02154; TEL: (617)890-5290; FAX: (617)890-5284; E-MAIL: [sec.boston@ieee.org](mailto:sec.boston@ieee.org).

-M. Ayman Shibib, Editor

#### ED Santa Clara Valley Chapter

— by Jeff Watt

The Santa Clara Valley Chapter of the Electron Devices Society has held four meetings and one half-day symposium since the beginning of the 1996-1997 year. At our first meeting on September 12, Dr. S. J. Prasad of National Semiconductor presented a talk on "Heterojunction Bipolar Technology and Applications." The talk covered the effects of material choice on device performance and discussed the current status of the applications of HBT technology in the areas of analog, digital, microwave and optical communications. The meeting was well attended.

On November 12, Dr. Ted Kamins of Hewlett-Packard Laboratories, presented a talk on "Silicon-Germanium Technology for High-Speed, Silicon Compatible Bipolar Transistors." The talk focused on the chemical vapor deposition techniques used to form SiGe layers and the limitations on the deposition and devices imposed by the materials properties, especially the strain associated with the lattice mismatch of Si and SiGe. The meeting was attended by more than 20 people.

On the afternoon of January 17, the chapter held a half-day symposium on recent advances in the area of display and imaging technology. Seven speakers from local companies presented papers on a variety of flat-panel display technologies, a CMOS-based imager, a diode array x-ray imager and a solid-state three dimensional display. The symposium was attended by more than 60 people.

At our next meeting on February 18, Professor Richard Muller of the University of California at Berkeley, gave a talk on "MEMS Technology for Microphotonics." This talk described the incorporation of micromechanical structures into fiber-optic systems, an approach which promises to reduce the costs of these systems and to

provide new application opportunities for them. Results were presented on actuation techniques appropriate for both beam switching and scanning using micromirrors made by folding micromachined structures out of the surface plane. The talk was attended by 35 people.

On March 18, Professor Greg Kovacs of Stanford University, presented a talk on "Micromachined Sensor and Actuator Research at Stanford University." The talk reviewed the micromachining projects underway at Stanford where the strategy is to build and maintain core competency in micromachining and circuit design, applying them to system design wherever possible. Examples of micromachined transducers and systems were presented in the domains of chemical, biological, mechanical and biomedical transducers. The meeting was attended by 39 people.

On April 15, Dr. Bob Gleason of Hewlett-Packard Laboratories, gave a talk on "Lithography for Manufacturing Integrated Circuits with Minimum Dimensions of 180 nm and Beyond." This talk discussed the challenges to extending optical lithography to 180 nm and beyond including resolution, resist processes, proximity and non-linearity. The status of technologies that may eventually supplant optical lithography was also presented.

#### Report on ICMTS '97

— by Sandy Grawet

The 1997 IEEE International Conference on Microelectronic Test Structures (ICMTS) was held in Monterey, CA., March 18 - 20 with attendance higher than anticipated. There were 164 attendees at the Tutorial and 189 attendees at the technical sessions. The interesting part of the attendance is that 63 of the attendees at the Tutorial and 72 at the technical sessions had not attended ICMTS before. This Conference meets in the US every three years.

The best paper award for the 1997 conference went to Hans Tuinhout and Maarten Vertregt of Philips Research of The Netherlands for the paper "Test Structures for Investigation of Metal Coverage Effects on MOSFET Matching". There were several other papers presented on the subject of matching which has been a topic of increased interest at ICMTS over

the past several years. The measurement of parasitic capacitance also continued as an important topic this year. Two firsts for this conference were the presentation of an analysis of MOS capacitance data which confirmed quantum mechanical effects in MOS devices and a holographic test structure which could be used for real time monitoring of wafer processing.

Additional information can be obtained regarding this conference by visiting the ICMTS web site at <http://www.ee.ed.ac.uk/~ajw/ICMTS/ICMTSindex.html>.

— Paul K.L. Yu, Editor

## Europe, Middle East & Africa (Region 8)

### MTT/ED Novosibirsk Chapter

— by Adrian Veron

The MTT/ED Novosibirsk, Russia Chapter was recently established. The first professional initiative of the local electrical and electronics engineering community is the organization of the 1997 IEEE - RUSSIA Conference "High Power Microwave Electronics: Measurements, Identification, Applications" (MIA-ME'97).

The Conference is organized by the MTT/ED Novosibirsk Chapter and the Novosibirsk State Technical University and co-sponsored by the MTT and ED IEEE Societies, Systems TV Ltd (Russia), Microtech Co. (Russia) and Society of Radioelectronics and Communications (Russia). The MIA-ME'97 Chairman is Prof. A. Vostrikov, the Rector of the Novosibirsk State Technical University.

The Conference will be held September 23-27, 1997 at the Novosibirsk State Technical University and will comprise three main sessions: S1 - Characterization of high power microwave devices as non-linear n-ports; S2 - Microwave passive and active filters, and acoustic-electronic devices and systems; S3 - Microwave/RF: Industrial, Scientific and Medicine Applications.

Two short courses will be offered in conjunction with the Conference: Computational methods analysis of non-linear circuits and Modeling and design of microwave active filters. Exhibitions and excursions to Siberia Medical Research Center, Microwave Research Institute and local microwave production companies will also be organized.

For further information, please contact the Chapter Chair: Prof. Dr. Boris Kapilevich, Siberia State Academy of Telecomm

& Informatics, Kirova St. no. 86, 630102 Novosibirsk, Russia; TEL: 7-3832-660943; FAX: 7-3832-222581, E-MAIL: boris@neic.nsk.su.

— Adrian Veron, Editor

### MTT/ED/AP/LEO UKRI Chapter

— by Neil Williams

The Chapter's 1997 programme includes over 20 events at venues throughout the region. In the first half of the year, a number of presentations by Distinguished IEEE Lecturers were arranged. We were pleased to invite Hans Stork (HP- Palo Alto) to talk on "SiGe bipolar technology-the first ten years" at UMIST in Manchester during his visit to the UK in May. Professor Tatsuo Itoh (University of California) kindly agreed to fit in a visit to University College, Dublin, to give his lecture on "Active integrated antennas for wireless applications" during his trip to the UK in April. In the same week, Professor Gabriel Rebiez (University of Michigan) took on the logistical challenge to give presentations on "High performance millimeter wave sensor front-ends using uniplanar and micromachined technologies" at both Queen's University, Belfast, and UMIST, Manchester. The program for the second half of the year is given below:

- September 30 - October 2: "Microwaves and RF '97 Conference and Exhibition" at the Wembley Centre, London: visit the Chapter's membership stand and let the Adcom members know what topics you would like to see covered in the 1998 program.
- November 24-25: The "5th International Workshop on High Performance Electron Devices for Microwave and Optoelectronic Applications" (EDMO'97) at King's College, London; a must for all EDS members!
- December: Lecture on "MVDS" by Dave Palmer of Philips Broadband Networks.

For further information, please contact the Chapter Chair: Neil Williams, ERA Technology Limited, Cleeve Road, Leatherhead, Surrey KT22 7SA, UK.; TEL: +44 (0) 1372 367061; FAX: +44 (0) 1372 367099; E-MAIL: neil.williams@era.co.uk.

### ED/MTT Egypt Chapter

— by Ibrahim Salem

Our chapter invited all its members to attend the 14th National Radio Science Conference (March 23-25, 1997) at Cairo University. The following 5 ED papers

were included in the program of 69 papers: "Development of Novel Sapphire Optical Fibers for Sensor Applications and IR Transmission" (by M.A. Sherif, Drexel University, USA); "A self-consistent Charge-Control Model for AlGaAs/GaAs HEMTs" (by M. Abdel Aziz, A.D. College and M. El-Banna, Alexandria University); "DSP-based testing of A/D converters" (by A.E. Salama, Cairo Univ. and M.Z. Elmeteny, Arento, Cairo); "Built-in self test structure for both digital and analog circuits" (by F.Z. Amer, Helwan Univ.); and "On the analysis and performance of microwave MESFET distributed amplifiers" (by I. Fikry, Egyptian Radio and TV Union, T. Shawk and Mostafa Elsaid, Cairo University).

The Academy of Scientific Research and Technology will hold its 15th NRSC in Helwan University on February 24-26, 1998. The commission B is for Field and waves, while commission D is for Electron Devices and Photonics. The deadline for submission of papers is October 11, 1997, while the notification of acceptance is November 15, 1997. The deadline for the submission of camera-ready material by December 15, 1997.

Finally, thanks to EDS Executive Office for putting us on the EDS-Chapter mailing list. For further information, please contact the Chapter Chair: Professor Ibrahim A. Salem, 17 Elqouba Street/3, Roxy Heliopolis, Cairo - 11341, Egypt; TEL: 202-349-8214; FAX: 202-263-6802; E-MAIL: isalem@brainy1.le-eg.com.

### ED Israel Chapter

— by Gady Golan

IEEE-EDS Israel and the Israeli Vacuum Society (IVS) held a meeting on January 6, 1997 at the Center For Technological Education - Holon. The subject of the meeting was "MBE and MOCVD structures and devices". The meeting was based on the showing of an IEDM videotape short course. The speakers were: Dr. D. Miller, Dr. G. Robinson, Dr. S. Lye and Dr. P. Dapkus. Professor Nathan Croitoru, Chair of the IEEE-EDS Israel Chapter, opened the meeting with a vision lecture. Dr. Gady Golan, secretary of the chapter, then talked on the "Introduction to MBE and MOCVD technologies". Dr. Yossi Rozenwaks from Tel Aviv University talked on "Advanced method for heterostructure characterization using AFM". Dr. Boaz Brill from El-OP industries talked on "MBE technologies and heterostructures". Dr. Edna Manheim from

(continued on page 14)



(continued from page 13)

INTEL Jerusalem talked on "Etching processes in microelectronics". The meeting was planned in collaboration with the Israeli Vacuum Society (IVS) and most of the audience were students from CTEH.

For further information, please contact Chapter Chair: Professor Nathan Croitoru, Tel-Aviv University, Faculty of Engineering, Dept. of Physical Electronics, Tel-Aviv 69978, Israel; TEL: 972-3-640-8138; FAX: 972-3-642-3508; E-MAIL: croitoru@eng.tau.ac.il.

### MTT/ED/AP/CPMT Bulgaria Chapter

— by Hristo D. Hristov

In order to further strengthen the IEEE MTT/ED/AP Bulgaria Chapter and make a better balance between its electromagnetic and technological branches, the Chapter status was changed to include the CPMT Society. The effective date of this change was January 28, 1997. Now, the MTT/ED/AP/CPMT Bulgaria Chapter numbers 1 senior member, 28 members and 2 student members. Since June 1995, when the Chapter was founded, its member count has doubled. Last October, the Bulgaria Section was visited by the IEEE TAB Colloquia Team with the 1996 IEEE President Wallace S. Read and Region 8 Director Peer Martin Larsen at the head. The two-day Colloquium in Sofia (October 13 - 14, 1996) was attended by 15 chapter members. Among the other presentations, they closely followed the 60-minute lecture, "Silicon-Based Millimeter Wave Devices", given by the EDS Distinguished Lecturer Johann-Friedrich Luy, from Daimler-Benz Research Center, Germany.

The Chapter Chair, Hristo Hristov, participated in the Divisions I and IV Region 8 Chapters Meeting at Prague, Czech Republic on September 8, 1996. He reported on the Chapter status and main activities in the period Sept. 1, 1995 - Sept. 1, 1996. During the open discussion, he stressed that the conference fees (especially in Europe) are too high for the East European scientists. As a result, only about 10% of all papers presented at the 1996 European Microwave Conference originated from EE/FSU countries, though the Conference took place only a short way from Prague. The EE/FSU microwave researchers are traditionally strong in the microwave field.

The chapter was active in creating the first IEEE Student Branch Library in Bulgaria situated at TU-Varna. The library was founded with the kind financial aid of IEEE

Headquarters, Region 8 Directorate and Bulgarian Private Sponsors. A one-day tutorial seminar on Computer Aided Education in the field of Applied Electromagnetics, Microwaves and Microelectronics was held in May 1997. Well-known education-oriented softwares (PSPICE, CAEME, AWAS, etc.) new PC multimedia techniques and softwares were demonstrated to faculty members and students from TU-Varna and TU-Sofia.

Our Chapter is supporting the newly established Black Sea Union of Applied Electromagnetism which is a regional scientific structure founded last year in Greece on the initiative of Nikolaos Uzunoglu, ED/MTT Greece Chapter Chair.

For further information please contact the Chapter Chair: Hristo D. Hristov, Department of Radiotechnics, Technical University of Varna, Studentska 1, 9010 Varna, Bulgaria; TEL: +359 52 302469; FAX: +359 52 302771; E-MAIL: ieeechp1@radio.tu-varna.bg.

— Terry Oxley, Editor

### ED Germany Chapter

— by Klaus Heime

The Germany Chapter had the pleasure of having an ED Distinguished Lecturer give a presentation. Dr. Hadis Morkoc, from the University of Illinois, Urbana, gave a very interesting talk on "Optoelectronic and electronic devices based on III-V-semiconductor nitrides". The lecture was attended by approximately 40 people from the university and industry in the Aachen area. A vivid discussion demonstrated the competence of the speaker and the strong interest of the audience in the subject presented.

For further information, please contact: Prof. Klaus Heime, RWTH Aachen, D-052056 Aachen; TEL: 49 241 807746; FAX: 49241 8888199; E-MAIL: mailbox@enterprise.rwth-aachen.de.

### ED Central and South Italy Chapter

— by Paolo Spirito

On May 20th, a lecture was presented on "Evoluzione e problematiche della tecnologia bipolare" by Dr. Niccolò Rinaldi at the Dipartimento di Ingegneria Elettronica dell'Università Federico II di Napoli, based on the IEEE Short Course on videotape "Bipolar Technology for BiCMOS VLSI."

The chapter will be co-sponsoring the "Annual National Meeting of the Electronic Group of CNR" which will be held in Sestri Levante, from June 19 to 22.

On June 28th, there will be a Seminar on "Modeling of power semiconductors for

circuit simulation" given by Dr. Cliff Ma of Analogy Corporation, Oregon, USA.

On September 13th, a lecture will be held on "SOI Mosfets - Modelling and characterization" by Professor Andrej Jakubowski, Warsaw, University of Technology, Poland.

On October 9th, lectures will be given on "Circuiti integrati a bassa tensione e basso consumo" by Dr. R. Baldoni, Silverstar, P. Malcovati, e A. Baschiroto of the University of Pavia, and Dr. F. Francesconi of Micronova.

For further information, please contact: Professor Paolo Spirito, Department of Electronics, University of Napoli, Italy; TEL: 39-81-7683138; FAX: 39-81-5934448; E-MAIL: spirito@diesun.die.unina.it.

### ED Spain Chapter

— by Ramon Alcubilla

The CDE-97 (Conferencia Dispositivos Electronicos 97) organized by the Spain Chapter was held in Barcelona February 20-21. More than 120 participants from academy research laboratories and industry participated in the meeting. There were 88 contributions with the following main topics: Power Devices (7), Physical and Circuit simulation (17), Heterojunction Devices (5), Sensors (18), Technology Characterization and Process Simulation (18), Optoelectronic Devices (9), Microelectronic Materials (5), Compound Semiconductors and Quantum Devices (7). Twenty-one contributions come from or result from a collaboration with institutions of 8 different countries: Germany (3), UK (6), Italy (3), USA (5), Ireland (1), Belgium (1), Poland (1), Netherlands (1). It is the first time that the Spanish Electron Devices community has had the opportunity to congregate and present their work and interests in a national forum. Proceedings are available on request to R. Alcubilla (all abstracts and 50% of the contributions are in English). The next occurrence of CDE will be in February 1999 in Madrid.

For further information, please contact: Ramon Alcubilla Gonzalez, Departament d'Enginyeria Electrònica, Modul C-4 Campus Nord, Barcelona 0803, Spain; TEL: 34-3-4016757; FAX 34-3-4016756; E-MAIL: alcubilla@eel.upc.es.

### ED/MTT France Chapter

— by Robert Adde

The Chapter main event for 1996 was its participation in the organization of the 4th European Gallium Arsenide and related III-V Compounds Applications Symposium (GAAS 96) in Paris, France, June 5-7. The Conference Chairman, Christian Rumel-

hard, and the Conference Secretary, Daniel Pasquet, are Chapter Bureau members. The Conference, which received technical co-sponsorship support from MTTs and EDS, included 7 invited papers and 69 communications. There is a European Workshop involving CAD Microwave Aspects of Electronic and Optoelectronic Circuits using III-V compounds which has 16 review contributions and is associated to GAAS96. It is organized by Philippe Dueme who is also a Chapter Committee member. This workshop, which is organized every year in a different country, brings together engineers working on both electron devices and microwave theory and techniques.

The Chapter started an IEEE membership campaign in 1996 which will continue in 1997. The main goals are: (1) Student Membership, (2) members in every company/university laboratory having ED or MTT related activity, and (3) Senior Membership.

For further information, please contact Chapter Chair: Dr. Robert Adde, IEF Bt 220, UPS, 91405 Orsay; TEL: 33-1-69-41-78-50; FAX: 33-1-60-19-25-93; E-MAIL: adde@ief-paris-sud.fr or r.adde@ieee.org.

— Robert G. Adde, Editor

## Asia & Pacific (Region 10)

### ED/LEO Australia Chapter

— by Chennupati Jagadish

Newly elected EDS Distinguished Lecturer Professor E. Herbert Li of the University of Hong Kong visited the chapter in February of 1997 and gave a seminar on "Quantum Well Intermixing for Optoelectronic Integrated Circuits." The seminar was organized jointly with the Australian National University.

Professor Rod Tucker, IEEE Fellow of the University of Melbourne, and Professor Allan Snyder, FRS, SMIEEE of the Australian National University and Dr. Gottfried Ungerboeck, IEEE Fellow, IBM Research Laboratory, Zurich, are winners of Australia's Premier Science Award - the Australia Prize. The Australia Prize was awarded for their contributions to the field of Telecommunications.

### ED/MTT India Chapter

— by K.S. Chari

The Chapter conducted several types of activities in the report period. The major activities among these were as follows:

- A special address by Dr. O.D. Budd Trapp, IEEE Fellow, on "Issues on Semiconductor Technology and Reliability" was hosted by the chapter over

dinner on January 23, 1997 at India International Center, New Delhi. The event was attended by select Indian semiconductor industry representatives and was very much appreciated.

- Two IEDM video courses on "Low Voltage/Low Power Devices" and "Semiconductor Manufacturing" were obtained on loan from the EDS Executive Office and were screened at IIT Delhi, DOE Delhi, Kurukshetra University, and Solid State Physics Laboratories, Delhi. A total of about 200

participants viewed these screenings and found the contents informative.

- Through several on-site expositions, a total of 7 new members have been enrolled into EDS.
- A total of 4 technical talks were arranged during the report period. The talk in the ED area of "Integrated Systems on Chip with CMOS Active Pixel Arrays", delivered by Dr. B Pain from the USA on January 17, 1997, was very well received.

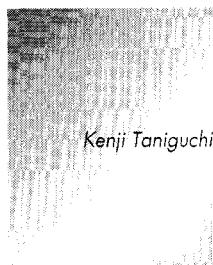
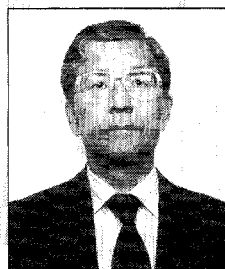
— Chennupati Jagadish, Editor

### Message from Chair and Secretary of Tokyo Chapter

— by Chihiro Hamaguchi and Kenji Taniguchi



Chihiro Hamaguchi



Kenji Taniguchi

As technical field activities, we have cooperated in technical meetings organized by two groups (ICD, SDM) of the Institute of Electronics, Information and Communication Engineers of Japan, and also with the two international conferences held in Japan. The technical meeting to review the IEDM was held on January 17, 1997, bringing together engineers working on VLSI and microwave devices for those who could not attend the IEDM. The speakers were Drs. Kikkawa (NEC), Takagi (Toshiba), Tamba (Hitachi) and Enomoto (NTT).

We have exchanged information and opinions with EDS executives at non-technical meetings. We decided to have no new chapters in Japan based on the fact that more than 70% of the EDS Tokyo Chapter members live in Tokyo Metropolitan area. We'll prepare a Japanese version of the

EDS membership brochure with the help of Dr. Jim Clemens to solicit young engineers to join EDS.

Professor I. C. Hamaguchi was very happy to have been able to support as Chapter Chair the nominations and endorsement of chapter members for IEEE technical field awards and Fellowships.

### Tokyo Chapter Joint Technical Meeting with IEICE

— by Kenji Taniguchi

The schedule of the Chapter's joint technical meetings with two groups (SDM and ICD) of IEICE (Institute of Electronics, Information and Communication Engineers) of Japan is as follows:

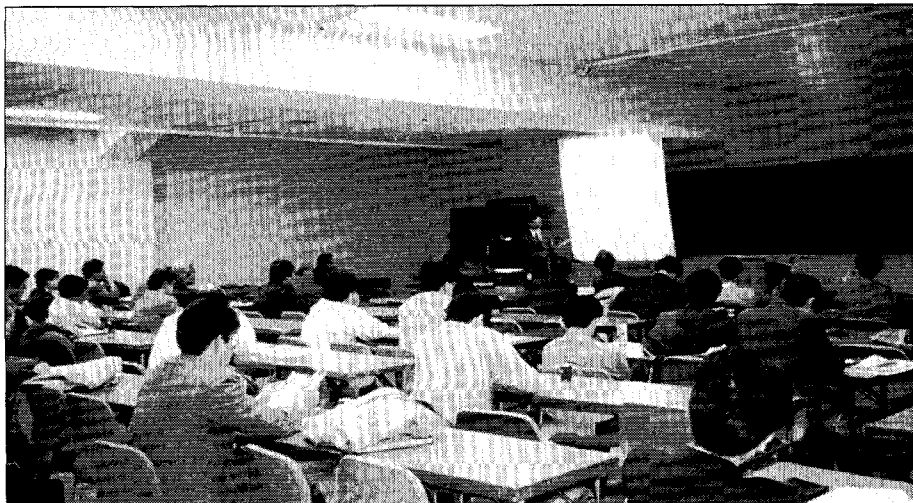
#### SDM:

- June 19-20, Fukuoka, "VLSI Circuit Technology (Low voltage, low power and High speed)"
- July 24-26, Seoul (Korea), "International Workshop on Advanced VLSI's"
- August 21-22, Sendai, "Semiconductor Fabrication and Ultra-Clean Technologies"
- September 25-26, Atsugi, "Process, Device and Circuit Simulation"
- October 16-17, Osaka, "Memories, Processors and DSP's"
- November 21, Tokyo, "Lithography Technologies"
- December 18-19, Kyoto, "Silicon Related Materials"
- January 23, 1998, Tokyo, "Metalization"
- February 20-21, 1998, Tokyo, "SOI and Bulk-MOS Device Technologies"

#### ICD:

- May 22-23, Tokyo, "Memory Chips and their Interface Technologies"
- June: joint meeting with SDM.
- July: joint meeting with SDM.

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- August 21-22, Sapporo, "Analog LSI's and Multimedia LSI's"
- September: joint meeting with SDM.
- October joint meeting with SDM.
- December 11-12, Shikoku, "Packaging Technologies for System LSI's"
- January 21-23, 1998, Tokyo, "Compound Semiconductor LSI's and Ultra-High Speed Devices"
- March 5-6, 1998, Tohoku, "ECAD for System-On-Silicon"

For further information, please contact: Professor H. Ishiura (SDM), Tokyo Institute of Technology; TEL: +81-45-924-5040; FAX +81-45-921-0898; E-MAIL: ishiwara@pi.titech.ac.jp; and Professor A. Iwata (ICD), Hiroshima University; TEL: +81-824-24-7856; FAX +81-824-22-7195; E-MAIL: iwa@ue.ipc.hiroshima-u.ac.jp.

— Hiroshi Iwai, Editor

### EDS Taipei Chapter Report of 1996 International Electron Devices and Materials Symposia (IEDMS)

— by S.C. Sun

The 1996 International Electron Devices and Materials Symposia was held in Hsinchu, Taiwan from December 16 to 20, 1996. National Tsing Hua University served as the host institution. The conference, jointly sponsored by the National Science Council, Ministry of Education of R.O.C., IEEE EDS Taipei Chapter, and Electronic Device and Material Association, was the twenty-fifth in a row of an annual series which was initiated in 1972, and marked the sixth international conference in a series. The conference has been organized into a two-

day tutorial short course and three-days, with six symposia. The tutorials were: MOS Gate Dielectrics by Prof. D.L. Kwong (UT Austin), Flash Memory by Prof. F. Masuoka (Tohoku U), DRAM Technology by Dr. T.C. Chen (IBM) and On-Chip Interconnection Technology by Dr. C.K. Hu (IBM). The symposia attracted over 500 attendees to over 300 oral and poster presentations. The six symposia were: (1) Silicon IC Technology (chaired by S.C. Sun); (2) Compound Semiconductor Devices and Physics (C.P. Lee); (3) Processes and Characterization of Electronic Materials (C.M. Wang); (4) Simulation and Modeling of VLSI Processes and Devices (S.S. Chung); (5) Display and Sensing Technology (H.C. Cheng); and (6) Elec-

tronic Packaging Technology (J.H. Jean). The invited speakers of the Symposium visited Etron Corporation, which was founded by Dr. Nicky Lu in the Hsinchu Science Park (shown in photo). Three keynote papers were given in the plenary session: "Trends in CMOS Technology and application development" by Tak Ning of IBM; "An Approach for Migrating to Giga-Scale Integration" by Eiji Takeda of Hitachi; and "Application of Micro-Electro-Mechanical Systems to Optoelectronics" by James Harris of Stanford University. The 1997 IEDMS will be held in December as a domestic conference. The 1998 IEDMS will be hosted by National Cheng Kung University in Tainan, Taiwan as an international conference.

### Report of SMTW Executive Committee Meeting

— by S.C. Sun

The executive committee of Semiconductor Manufacturing Technology Workshop (SMTW) held a meeting on March 14, 1997, at Vanguard International Corp., Hsinchu, Taiwan. SMTW has been technically co-sponsored by EDS since its inception in 1993. The decision was made to change the SMTW from an annual to a biennial event to maintain its high quality. The 5th SMTW will be held in May, 1998. The host company will be United Microelectronics Corporation (UMC). H.J. Wu of UMC was elected as the next executive committee chairman.

— S.C. Sun, Editor



Front row from left: Tak Ning, Bob Dutton, T. P. Ma, Ping Ko. Standing from left: Z. P. Yu, Gary Bronner, Nicky Lu, K. Shenai, S. C. Sun, S. Kawamura, Lisa Su, C. P. Chang, H-S Wong, Joe Ting and C. C. Shive at the 1996 International Electron Devices and Materials Symposium (IEDMS).

# EDS Meetings Calendar

(As of May 28, 1997)

## U.S., Canada & Latin America (Regions 1-6, 7 & 9)

July 20 - 23, 1997, \* **IEEE UNIVERSITY/ GOVERNMENT/INDUSTRY MICROELECTRONICS SYMPOSIUM**, Location: Rochester Institute of Technology, Rochester, NY, Contact: Lynn F. Fuller, Tel: (716) 475-2035, Fax: (716) 475-5041, E-Mail: lffeee@ritvax.isc.rit.edu, Deadline: Past Due

July 27 - Aug. 1, 1997, @ **INTER SOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE**, Location: Hilton Hawaiian Village Hotel, Honolulu, HI, Contact: Rosa Serrata, Tel: (212) 705-7450, Fax: (212) 705-3294, E-Mail: rosas@aiche.org, Deadline: Past Due

Aug. 4 - 6, 1997, \* **IEEE CORNELL CONFERENCE ON ADVANCED CONCEPTS IN HIGH SPEED SEMICONDUCTOR DEVICES AND CIRCUITS**, Location: Cornell University, Ithaca, NY, Contact: R. Chris Clarke, Tel: (412) 256-1997, Fax: (412) 256-1877, E-Mail: cclarke@aescad.pgh.wec.com, Deadline: Past Due

Sept. 7 - 11, 1997, @ **IEEE INTERNATIONAL SYMPOSIUM ON COMPOUND SEMICONDUCTORS**, Location: Hotel Del Coronado, San Diego, CA, Contact: Samantha Padilla, Tel: (908) 562-3894, Fax: (908) 562-8434, E-Mail: s.padilla@ieee.org, Deadline: Past Due

Sept. 8 - 10, 1997, @ **IEEE INTERNATIONAL CONFERENCE ON SIMULATION OF SEMICONDUCTOR PROCESSES AND DEVICES**, Location: Boston Marriott Cambridge Hotel, Cambridge, MA, Contact: Fely Barrera, Tel: (415) 723-1349, Fax: (415) 725-7731, E-Mail: fely@ee.stanford.edu, Deadline: Past Due

Sept. 10 - 12, 1997, \* **IEEE/SEMI ADVANCED SEMICONDUCTOR MANUFACTURING CONFERENCE AND WORKSHOP**, Location: Hyatt Regency Cambridge Hotel, Cambridge, MA, Contact: Margaret M. Kindling, Tel: (202) 289-0440, Fax: (202) 289-0441, E-Mail: mkindling@semi.org, Deadline: Past Due

Sept. 15 - 17, 1997, ✓ **CONFERENCE ON ADVANCED RESEARCH IN VLSI**, Location: University of Michigan, Ann Arbor, MI, Contact: Richard B. Brown, Tel: (313) 763-4207, Fax: (313) 763-9324, E-Mail: brown@engin.umich.edu, Deadline: Past Due

Sept. 15 - 16 & 18-19, 1997, # **INTERNATIONAL WORKSHOPS ON DISPLAY MATERIALS AND DEVICES**, Location: Sheraton Centre Hotel, Toronto, Canada, Contact: Ralph Nadell, Tel: (212) 620-3341, Fax: (212) 620-3379, E-Mail: nadell@newyork.palisades.org, Deadline: Past Due

Sept. 16 - 18, 1997 # **INTERNATIONAL DISPLAY RESEARCH CONFERENCE**, Location: Sheraton Center Toronto Hotel, Toronto, Canada, Contact: Ralph Nadell, Tel: (212) 620-3341, Fax: (212) 620-3379, E-Mail: nadell@newyork.palisades.org, Deadline: Past Due

Sept. 23 - 25, 1997, ✓ **ELECTRICAL OVERSTRESS/ELECTROSTATIC DISCHARGE SYMPOSIUM**, Location: Santa Clara Convention Center, Santa Clara, CA, Contact: ESD Assoc., Tel: (315) 339-6937, Fax: (315) 339-6793, E-Mail: None, Deadline: Past Due

Sept. 28 - 30, 1997, \* **IEEE BIPOLAR/BICMOS CIRCUITS AND TECHNOLOGY MEETING**, Location: Minneapolis Marriott City Center, Minneapolis, MN, Contact: Janice V. Jopke, Tel: (612) 934-5082, Fax: (612) 934-6741, E-Mail: jjopke@aol.com, Deadline: Past Due

Sept. 29 - Oct. 3, 1997, \* **IEEE PHOTOVOLTAIC SPECIALISTS CONFERENCE**, Location: Anaheim Marriott Hotel, Anaheim, CA, Contact: Paul A. Basore, Tel: 61-2-385-6151, Fax: 61-2-662-4240, E-Mail: p.basore@unsw.edu.au, Deadline: Past Due

Oct. 6 - 8, 1997, @ **IEEE INTERNATIONAL SYMPOSIUM ON SEMICONDUCTOR MANUFACTURING**, Location: Westin St. Francis Hotel, San Francisco, CA, Contact: Court Skinner, Tel: (408) 721-7420, Fax: (408) 721-6454, E-Mail: l.skinner@ieee.org, Deadline: Past Due

Oct. 6 - 9, 1997, \* **IEEE INTERNATIONAL SOI CONFERENCE**, Location: Tenaya Lodge at Yosemite, Fish Camp, CA, Contact: Sandra Grawet, Tel: (310) 316-5153, Fax: (310) 316-0713, E-Mail: 70541.1225@compuserve.com, Deadline: Past Due

Oct. 12, 1997, ✓ **GALLIUM ARSENIDE RELIABILITY WORKSHOP**, Location: Anaheim Marriott Hotel, Anaheim, CA, Contact: Anthony Immorlica, Tel: (603) 885-1100, Fax: (603) 885-1074, E-Mail: None, Deadline: 8/1/97

Oct. 12 - 15, 1997, \* **IEEE GALLIUM ARSENIDE INTEGRATED CIRCUITS SYMPOSIUM**, Location: Anaheim Marriott Hotel, Anaheim, CA, Contact: Richard B. Brown, Tel: (313) 763-4207, Fax: (313) 763-9324, E-Mail: brown@engin.umich.edu, Deadline: Past Due

Oct. 12 - 15, 1997, # **IEEE INTERNATIONAL CONFERENCE ON COMPUTER DESIGN: VLSI IN COMPUTERS AND PROCESSORS**, Location: Hyatt Regency Hotel, Austin, TX, Contact: IEEE Computer Society, Tel: (202) 371-1013, Fax: (202) 728-0884, E-Mail: swagner@computer.org, Deadline: Past Due

Oct. 13 - 16, 1997, \* **IEEE INTERNATIONAL INTEGRATED RELIABILITY WORKSHOP**, Location: Stanford Sierra Camp, Lake Tahoe, CA, Contact: Ehren Achee, Tel: (512) 869-1935, Fax: (512) 869-0992, E-Mail: jsreedholm@aol.com, Deadline: 7/7/97

Oct. 20 - 24, 1997, ✓ **MANUFACTURING SCIENCE AND TECHNOLOGY GROUP PROGRAM**, Location: San Jose Convention Center, San Jose, CA, Contact: Frederick H. Dill, Tel: (914) 945-3332, Fax: (914) 945-4520, E-Mail: f.dill@ieee.org, Deadline: 9/20/97

Nov. 5, 1997, ✓ **IEEE ELECTRON DEVICES ACTIVITIES IN WESTERN NEW YORK CONFERENCE**, Location: Chester F. Carlson Auditorium, Rochester Institute of Technology, Rochester, NY, Contact: Karl Hirschman, Tel: (716) 475-5130, Fax: (716) 475-5041, E-Mail: kdhemc@rit.edu, Deadline: 10/1/97

Nov. 9 - 12, 1997, \* **IEEE INTELLIGENT TRANSPORTATION SYSTEMS CONFERENCE**, Location: Boston Park Plaza Hotel, Boston, MA, Contact: IEEE Boston Section, Tel: (617) 890-5290, Fax: (617) 890-5294, E-Mail: sec.boston@ieee.org, Deadline: Past Due

Nov. 9 - 13, 1997, # **IEEE INTERNATIONAL CONFERENCE ON COMPUTER-AIDED DESIGN**, Location: Red Lion Hotel, San Jose, CA, Contact: Darrin Judkins, Tel: (303) 530-4562, Fax: (303) 530-4334, E-Mail: darrin@dac.com, Deadline: Past Due

Dec. 4 - 6, 1997, \* **IEEE SEMICONDUCTOR INTERFACE SPECIALISTS CONFERENCE**, Location: Mills House Hotel, Charleston, SC, Contact: Dan Fleetwood, Tel: (505) 844-1825, Fax: (505) 844-2991, E-Mail: dmffleet@sandia.gov, Deadline: 8/7/97

Dec. 7 - 10, 1997, \* **IEEE INTERNATIONAL ELECTRON DEVICES MEETING**, Location: Washington Hilton & Towers Hotel, Washington, DC, Contact: Phyllis Mahoney, Tel: (301) 527-0900, Fax: (301) 527-0994, E-Mail: pwma-honey@aol.com, Deadline: Past Due

February 22 - 27, 1998, ✓ **HIGH TEMPERATURE ELECTRONIC MATERIALS AND DEVICES CONFERENCE**, Location: Bahia Hotel, San Diego, CA, Contact: Engineering Foundation, Tel: (212) 705-7837, Fax: (212) 705-7441, E-Mail: engfnd@aol.com, Deadline: 8/31/97

March 30 - Apr. 2, 1998, \* **IEEE INTERNATIONAL RELIABILITY PHYSICS SYMPOSIUM**, Location: Reno Hilton Hotel, Reno, NV, Contact: Ann N. Campbell, Tel: (505) 844-7452, Fax: (505) 844-2991, E-Mail: ancampbe@sandia.gov, Deadline: Not Available

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

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

April 6 - 8, 1998, ✓ **INTERNATIONAL CONFERENCE ON MODELING AND SIMULATION OF MICROSYSTEMS, SEMICONDUCTORS, SENSORS AND ACTUATORS**, Location: Santa Clara Marriott Hotel, Santa Clara, CA, Contact: Andreas Wild, Tel: (602) 413-8170, Fax: (602) 413-4450, E-Mail: andreas\_wild@latqmg.sps.mot.com, Deadline: Not Available

May 11 - 13, 1998, ✓ **INTERNATIONAL SYMPOSIUM ON PLASMA PROCESS-INDUCED DAMAGE**, Location: Red Lion Hotel, San Jose, CA, Contact: Della Miller, Tel: (408) 737-0767, Fax: (408) 737-2403, E-Mail: della@technicalmarketing.com, Deadline: Not Available

May 11 - 14, 1998, \* **IEEE CUSTOM INTEGRATED CIRCUITS CONFERENCE**, Location: Westin Hotel / Santa Clara Convention Center, Santa Clara, CA, Contact: Melissa Widerkehr, Tel: (301) 527-0902, Fax: (301) 527-0994, E-Mail: cicc97@aol.com, Deadline: Not Available

June, 1998, @ **IEEE SEMICONDUCTING AND INSULATING MATERIALS CONFERENCE**, Location: Berkeley Marina Marriott Hotel, Berkeley, CA, Contact: Zuzanna Liliental-Weber, Tel: (510) 486-6276, Fax: (510) 486-4995, E-Mail: zlw@ux5.lbl.gov, Deadline: Not Available

June 7, 1998, @ **IEEE INTERNATIONAL WORKSHOP ON STATISTICAL METROLOGY**, Location: Hilton Hawaiian Village Hotel, Honolulu, HI, Contact: Harold Hosack, Tel: Not Available, Fax: Not Available, E-Mail: hosack@spdc.ti.com, Deadline: Not Available

June 8 - 11, 1998, ✓ **IEEE SYMPOSIUM ON VLSI TECHNOLOGY**, Location: Hilton Hawaiian Village Hotel, Honolulu, HI, Contact: Melissa Widerkehr, Tel: (301) 527-0902, Fax: (301) 527-0994, E-Mail: vlsi97@aol.com, Deadline: 1/7/98

June 10 - 13, 1998 @ **IEEE SYMPOSIUM ON VLSI CIRCUITS**, Location: Hilton Hawaiian Village Hotel, Honolulu, HI, Contact: Melissa Widerkehr, Tel: (301) 527-0902, Fax: (301) 527-0994, E-Mail: vlsi97@aol.com, Deadline: 1/7/98

June 14 - 19, 1998, ✓ **INTERNATIONAL HIGH TEMPERATURE ELECTRONICS CONFERENCE**, Location: Albuquerque Marriott Hotel, Albuquerque, NM, Contact: Richard R. Grzybowski, Tel: (860) 610-7399, Fax: (860) 610-7852, E-Mail: grzyborr@utrc.utc.com, Deadline: 7/1/97

June 22 - 24, 1998, \* **IEEE DEVICE RESEARCH CONFERENCE**, Location: University of Virginia, Charlottesville, VA, Contact: Emmanuel Crabbe, Tel: (914) 892-2056, Fax: (914) 892-2568, E-Mail: crabbe@watson.ibm.com, Deadline: Not Available

July 19 - 24, 1998, @ **IEEE INTERNATIONAL VACUUM MICROELECTRONICS CONFERENCE**, Location: The Grove Park Inn Resort, Asheville, NC, Contact: Rene Gielen, Tel: (919)

515-2378, Fax: (919) 515-7724, E-Mail: rene\_gielen@ncsu.edu, Deadline: 5/98

August 2 - 6, 1998, \* **IEEE NON-VOLATILE SEMICONDUCTOR MEMORY WORKSHOP**, Location: Hyatt Regency Hotel, Monterey, CA, Contact: AL Fazio, M/S RN 3-01, Intel Corporation, 2200 Mission College Blvd., Santa Clara, CA 95052, Tel: (408) 765-9610, Fax: (408) 765-9206, E-Mail: fazio@td2cad.intel.com, Deadline: Not Available

August 2 - 6, 1998, @ **INTERSOCIETY ENERGY CONVERSION ENGINEERING CONFERENCE**, Location: Sheraton Colorado Springs Hotel, Colorado Springs, CO, Contact: David L. Black, Tel: (202) 547-6854, Fax: (202) 547-6854, E-Mail: None, Deadline: Not Available

Sept. 27 - 29, 1998, \* **IEEE BIPOLAR/BICMOS CIRCUITS AND TECHNOLOGY MEETING**, Location: Not Available, Contact: Janice V. Jopke, Tel: (612) 934-5082, Fax: (612) 934-6741, E-Mail: jjopke@aol.com, Deadline: 3/30/98

December 6 - 9, 1998, \* **IEEE INTERNATIONAL ELECTRON DEVICES MEETING**, Location: San Francisco Hilton & Towers Hotel, San Francisco, CA, Contact: Phyllis Mahoney, Tel: (301) 527-0900, Fax: (301) 527-0994, E-Mail: pwma-honey@aol.com, Deadline: Not Available

## Europe, Middle East & Africa (Region 8)

Sept. 15 - 17, 1997, ✓ **INTERNATIONAL CONFERENCE ON MICROELECTRONICS**, Location: University of Nis, Nis, Serbia, Contact: Tatjana Trajkovic, Tel: 381-18-49-155, Fax: 381-18-46-180, E-Mail: miel@efnis.ni.ac.yu, Deadline: Past Due

Sept. 19, 1997, ✓ **HIGH FREQUENCY POST-GRADUATE STUDENT COLLOQUIUM**, Location: Leeds University, Leeds, UK, Contact: Stavros Iezekiel, Tel: 44-113-233-2000, Fax: 44-113-233-2032, E-Mail: s.iezekiel@elec-eng.leeds.ac.uk, Deadline: Not Available

Sept. 22 - 24, 1997, ✓ **EUROPEAN SOLID-STATE DEVICE RESEARCH CONFERENCE**, Location: Forum am Schloßpark, Ludwigsburg, Germany, Contact: Herbert Gruenbacher, Tel: 43-1-58801-8150, Fax: 43-1-586-8697, E-Mail: hg@vlsivie.tuwien.ac.at, Deadline: Past Due

Sept. 23 - 25, 1997, ✓ **HIGH POWER MICROWAVE ELECTRONICS: MEASUREMENTS, IDENTIFICATIONS, APPLICATIONS CONFERENCE**, Location: Novosibirsk State Technical University, Novosibirsk, Russia, Contact: Vasily Snournitsin, Tel: 7-3832-460555, Fax: 7-3832-462598, E-Mail: crra@nstu.nsk.su, Deadline: Past Due

Oct. 7 - 10, 1997, ✓ **EUROPEAN SYMPOSIUM ON RELIABILITY OF ELECTRON DEVICES, FAILURE PHYSICS AND ANALYSIS**, Location: Palatium of Arcachon, Arcachon, France, Contact: Nathalie Labat, Tel: 33-05-56-84-65-51, Fax: 33-05-56-37-15-45, E-Mail: labat@ixl.u-bordeaux.fr, Deadline: Past Due

Oct. 8 - 11, 1997, \* **INTERNATIONAL SEMI-CONDUCTOR CONFERENCE**, Location: Mountain Resort, Sinaia, Romania, Contact: Doina Vancu, Tel: 40-1-6332398, Fax: 40-1-3127519, E-Mail: cas@mail.sfos.ro, Deadline: Past Due

Nov. 24 - 25, 1997, ✓ **WORKSHOP ON HIGH PERFORMANCE ELECTRON DEVICES FOR MICROWAVE AND OPTOELECTRONIC APPLICATIONS**, Location: King's College London, The Strand, London, UK, Contact: Ali A. Rezazadeh, Tel: 44-171-873-2879, Fax: 44-171-873-2879, E-Mail: a.rezazadeh@kcl.ac.uk, Deadline: 9/1/97

March 2 - 4, 1998, ✓ **INTERNATIONAL CARACAS CONFERENCE ON DEVICES, CIRCUITS AND SYSTEMS**, Location: Margarita Island, Venezuela, Contact: Francisco J. Garcia Sanchez, Tel: 58-2-9064025, Fax: 58-2-9064025, E-Mail: fgarcia@usb.ve, Deadline: Not Available

June 7 - 12, 1998, ✓ **INTERNATIONAL CONFERENCE ON HIGH-POWER PARTICLE BEAMS**, Location: Haifa, Israel, Contact: Joseph Siloh, Tel: 972-4-8795016, Fax: 972-4-8795315, E-Mail: jshiloh@rafael.co.il, Deadline: Not Available

June 14 - 19, 1998, ✓ **ELECTROMAGNETICS CONFERENCE**, Location: Tel-Aviv, Israel, Contact: Joseph Shiloh, Tel: 972-4-8795016, Fax: 972-4-8795315, E-Mail: jshiloh@rafael.co.il, Deadline: Not Available

June 24 - 26, 1998, ✓ **EUROPEAN WORKSHOP ON LOW TEMPERATURE ELECTRONICS**, Location: San Miniato, Tuscany, Italy, Contact: Cor L. Claeyss, Tel: 32-16-28-13-28, Fax: 32-16-28-12-14, E-Mail: claeyss@imec.be, Deadline: 3/15/98

July 6 - 10, 1998, @ **IEEE WORLD CONFERENCE ON PHOTOVOLTAIC ENERGY CONVERSION**, Location: Vienna, Austria, Contact: Sheila G. Bailey, Tel: (216) 433-2228, Fax: (216) 433-6106, E-Mail: sheila.bailey@lerc.nasa.gov, Deadline: Not Available

Sept. 2 - 4, 1998, @ **IEEE INTERNATIONAL CONFERENCE ON SIMULATION OF SEMI-CONDUCTOR PROCESSES AND DEVICES**, Location: Leuven, Belgium, Contact: Kristin De Meyer, Tel: 32-16-281322, Fax: 32-16-281214, E-Mail: demeyer@imec.be, Deadline: Not Available

Sept. 7 - 11, 1998, ✓ **EUROPEAN SOLID-STATE DEVICE RESEARCH CONFERENCE**, Location: Bordeaux, France, Contact: Herbert

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## Asia & Pacific (Region 10)

July 7 - 10, 1997, # **INTERNATIONAL MICRO-PROCESS AND NANOTECHNOLOGY CONFERENCE**, Location: Nagoya Congress Center, Nagoya, Japan, Contact: Secretariat-MicroProcess '97, Tel: 81-3-5814-5800, Fax: 81-3-5814-5823, E-Mail: conf@bcasj.or.jp, Deadline: Not Available

July 21 - 25, 1997, ✓ **IEEE INTERNATIONAL SYMPOSIUM ON PHYSICAL AND FAILURE ANALYSIS OF INTEGRATED CIRCUITS**, Location: Raffles City Convention Centre, Singapore, Contact: Philip Ho, Tel: 65-840-2480, Fax: 65-840-2568, E-Mail: pho@micro.lucent.com, Deadline: Past Due

Aug. 17 - 21, 1997, @ **IEEE INTERNATIONAL VACUUM MICROELECTRONICS CONFERENCE**, Location: Hotel Hyundai, Kyongju, Korea, Contact: Jae Soo Yoo, Tel: 82-2-820-5274, Fax: 82-2-822-0635, E-Mail: ivmc97@cau.ac.kr, Dead: line: Past Due

Aug. 30, 1997, ✓ **HONG KONG ELECTRON DEVICES MEETING**, Location: City University of Hong Kong, Hong Kong, Contact: Hei Wong, Tel: 852-2788-7722, Fax: 852-2788-7791, E-Mail: eehwong@cityu.edu.hk, Deadline: Past Due

Sept. 16 - 19, 1997, ✓ **INTERNATIONAL CONFERENCE ON SOLID-STATE DEVICES AND MATERIALS**, Location: Act City Hamamatsu, Hamamatsu, Japan, Contact: Secretariat of SSDM '97, Tel: 81-3-5814-5800, Fax: 81-3-5814-5823, E-Mail: config3@bcasj.or.jp, Deadline: Past Due

Oct. 8 - 10, 1997, ✓ **INTERNATIONAL CONFERENCE ON MICROELECTRONICS**, Location: Trade Mark Building, Jakarta, Indonesia, Contact: Onno W. Purbo, Tel: 62-22-2506280, Fax: 62-22-2508763, E-Mail: onno@kalpataru.netura.net.id, Deadline: Past Due

Oct. 13 - 15, 1997, ✓ **INTERNATIONAL CONFERENCE ON VLSI AND CAD**, Location: Seoul TEMF Hotel, Seoul, Korea, Contact: Sung Tae Ahn, Tel: 82-2-780-6001, Fax: 82-2-760-6060, E-Mail: intercom@soback.kor.net, Deadline: Past Due

Oct. 27 - 31, 1997, ✓ **INTERNATIONAL CONFERENCE ON NITRIDE SEMICONDUCTORS**, Location: Tokushima Prefectural Hall, Aiba, Tokushima, Japan, Contact: Sadafumi Yoshida, Tel: 81-248-54-2222, Fax: 81-298-58-5434, E-Mail: syoshida@etl.go.jp, Deadline: Not Available

Jan. 14 - 17, 1998 ✓ **INTERNATIONAL CONFERENCE ON COMPUTERS AND DEVICES FOR COMMUNICATION**, Location: Science City, E-M Bye Pass, Calcutta, India, Contact: P.K. Basu, Tel: 91-33-350-9413, Fax: 91-33-351-5828, E-Mail: codec@cucc.ernet.in, Deadline: Past Due

March 23 - 26, 1998, \* **INTERNATIONAL CONFERENCE ON MICROELECTRONIC TEST STRUCTURES**, Location: Kanazawa, Japan, Contact: Dr. Ohzone, Toyama Prefectural University, Kurokawa, Kosugi-Machi, Imizu-Gun, Toyama, 939-03, Japan, Tel: 81-776-56-7500 ext. 501, Fax: 81-766-56-6172, E-Mail: ohzone@tpusv.pu-toyama.ac.jp, Deadline: 8/22/97

May 11 - 15, 1998, @ **IEEE INTERNATIONAL CONFERENCE ON INDIUM PHOSPHIDE AND RELATED MATERIALS**, Location: Tara Hyannis Hotel & Resort, Tsukuba, Japan, Contact: Melissa Estrin, Tel: (908) 562-3896, Fax: (908) 562-8434, E-Mail: m.estrin@ieee.org, Deadline: Past Due

June 3 - 6, 1998, @ **IEEE INTERNATIONAL SYMPOSIUM ON POWER SEMICONDUCTOR DEVICES & INTEGRATED CIRCUITS**, Location: Rihga Royal Hotel, Kyoto, Japan, Contact: Yoshitaka Sugawara, Tel: 81-6-494-9736, Fax: 81-6-494-9728, E-Mail: None, Deadline: 10/15/97

Dec., 1998, ✓ **CONFERENCE ON OPTOELECTRONIC AND MICROELECTRONIC MATERIALS AND DEVICES**, Location: Perth, Australia, Contact: Laurie Faraone, Tel: 61-9-380-3104, Fax: 61-9-380-1065, E-Mail: faraone@ee.uwa.edu.au, Deadline: Not Available

## University (continued from page 2)

how T1 transmission has played a role in achieving the best sound quality of long distance phone conversation. We also sponsored the Tektronix and Zack-Joseph Electronics Product show which featured products such as the Digital Oscilloscope with and without InstaVu, a Portable Digital Oscilloscope, Logic Analyzer, Arbitrary Waveform Generator, Spectrum Analyzer and a Fibermini Optical Time Domain Reflectometer (OTDR). Both companies donated a DMM meter that was raffled off to one of the engineering students. They also provided lunch for all the guests. Six foot submarine sandwiches were on the menu for that day.

The most exciting of all the events was the tour of the CAVE. The CAVE is a 3-D video and audio environment located in the Engineering and Research Facilities building here at UIC. There were 12 tours throughout the day. The CAVE currently has 4 projectors and are used to throw full-color, computer generated images onto three walls and the floor. CAVE software synchronizes all the devices and calculates the correct perspective for each wall. To experience the stereo effect, the user wears

active stereo glasses which alternately block the left and right eye. There is also an interactive wand which is a 3-D mouse with a joystick for navigating and three buttons which can be programmed for interactivity.

Finals are usually brutal so I thought it would be fun to do something out of the ordinary. I organized a group outing to the Jenny Jones Show located in Downtown Chicago. A group of 13 students were told that we were attending a "Great" show, but they were unable to tell us what the topic would be. It turned out to be a show on "Calendar Models" in which Montel Jordan sang and heartthrob Brian McKnight caused a scene. They also featured gorgeous women from the "Hooters" calendar and handsome men from the "Men in Uniform" calendars. Needless to say, a good time was had by all.

Well, back to campus and time to get back to work. Every year Engineering Expo is held to allow Seniors to display their senior design project. This is where IEEE puts on the Robot Competition. This year will be the 5th annual Robot Competition in which high school students and other universities will be allowed to participate. The purpose of this event is to

allow students to apply all their knowledge to a challenging project.

The robot design must be autonomous, meaning there may be no human control or intervention. There are weight and height restrictions on the robot as well. The robot will run on a figure eight track laid out with a reflective strip of tape laid on a black surface. The track itself is made of three pieces of wood and the perimeter of the track has dinosaurs. If the robot knocks one down, 0.8 seconds is added to their final time. The three contestants with the fastest robot that makes it around the track will win an award. Students are also allowed to include their robot as a senior design project.

The Robot Competition is a fun way to end the semester. IEEE-UIC tries to balance education with excitement and I hope this was accomplished. For more information on our events, please visit our web page at <http://www.eecs.uic.edu/~ieee> or e-mail us at [ieee@eecs.uic.edu](mailto:ieee@eecs.uic.edu). You may also call (312) 355-0566. My E-Mail address is [ovillarr@eecs.uic.edu](mailto:ovillarr@eecs.uic.edu)

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