



SOLID-STATE CIRCUITS



IEEE Solid-State Circuits Society Quarterly Newsletter

ISSCC 2000 Preview

ISSCC 2000 ACTIVITIES

The 47th International Solid-State Circuits Conference activities will be held Sunday, February 6 through Thursday, February 10, 2000, at the San Francisco Marriott. The lineup of events is summarized in Table I. Tutorial lectures are presented in six subject areas on Sunday, February 6, the day before the formal start of the conference. Three sessions of the Short Course are scheduled on Thursday, February 10, the day after the formal conference



Richard Crisp
Program Chair
ISSCC 2000
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Sunday, Feb 6	Tutorials	8:00AM–3:30PM
Monday-Wednesday, Feb 7-9	Paper Sessions	8:30AM–5:30PM
Monday and Tuesday, Feb 7,8	Evening Panels	8–10PM
Monday, Feb 7	Social Hour	5–6PM
Thursday, Feb 10	Short Course	8:00AM–4:30PM, 10:00AM–6:30PM and 1:30PM- 9:30PM

Table 1. 2000 ISSCC Activity Schedule

close. There will be 25 technical paper sessions composed of a total of 172 papers on Monday through Wednesday. There are three papers in the plenary session and the remaining papers will be presented in five parallel sessions. A total of 8 evening discussion sessions will be held on Monday and Tuesday evenings. A technical book display will be located nearby the paper sessions, and a social hour is scheduled for Monday afternoon following the paper sessions.

SHORT COURSE

The title of the ISSCC 2000 Short Course is *Circuits and Devices for RF Wireless Networks*, and lecturers and their topics are summarized in Table 2. This Short Course is intended to jump start engineers in the design and development of wireless communications devices by organizing them into three sections covering LNAs, Mixers, and Power Amplifiers, respectively. Emphasis on devices, modeling, and practical considerations will be a common theme. With personal communications devices expected to play an increasing role in the new millenni-

um, the topic is highly relevant to the conference theme and should provide value to the attendees.

TUTORIALS

Tutorials introduce attendees to the state-of-the-art in integrated circuits and give understanding of and perspective on presentations at the ISSCC. Each tutorial is on a seminal topic related to the conference and is presented by an expert member of the Technical Program Committee. The lecturers and the titles of their presentations are shown in Table 3. All six tutorials will be presented in parallel, so it is possible to register for any combination of three tutorials.

TECHNICAL PAPER SESSIONS

The three papers of the plenary session are closely coupled to this



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Lecturer	Title
Allen Podell	"The low down on low-noise amplifiers"
Barrie Gilbert	"Analog devices fundamental aspects of modern active mixer design"
Lawrence Larson, University of California, San Diego	"Power amplifier device and circuit design for next-generation wireless applications"

Table 2. Short-Course Lecturers and Titles.

Presenter	Title
Paul Hurst	"Analog CMOS circuits for baseband receivers"
Gitty Nasserbahkt	"Home networking"
Kerry Bernstein	"SOI circuit design considerations"
Albert Theuwissen	"Design for manufacturability of CMOS image sensors"
Dong Ho Lee	"What is the correct package for my integrated circuit?"
Chris Nichol	"DSP processors for wireless communications"

Table 3. Tutorial Lecturers and Titles

year's conference theme, ICs for 21st Century Systems. In the first paper, N. Noda of Toyota Motor Corporation, of Toyota, Japan, will describe the requirements for the evolution of Automotive Electronics Systems in his paper, "21st century cars and ICs." The second paper, "The new millennium: wireless technologies for a truly mobile society," presented by G. Weinberger of Infineon Technologies, Munich, Germany, will discuss the requirements and development of portable communications devices in the next century. Finally, discussing semiconductor device technologies in the next century will be M. Pinto of Lucent Technologies' Bell Labs in his paper, "Atoms to applets: Building systems ICs in the 21st century."

The 172 technical papers will be presented in 25 sessions on Monday, Tuesday, and Wednesday. The session titles, group by topic, include:

Analog

- "Nyquist rate data converters" (Monday afternoon)
- "Filters and amplifiers" (Tuesday morning)
- "Oversampling converters" (Wednesday morning)
- "Analog techniques" (Wednesday afternoon)

Communications

- "Gigabit rate communications" (Monday afternoon)
- "Wireless Rx/Tx" (Tuesday morning)
- "Frequency synthesizers and dividers" (Tuesday afternoon)
- "Wireline communications" (Wednesday morning)

- "Wireless building blocks" (Wednesday afternoon)

Digital

- "High-frequency microprocessors" (Monday afternoon)
- "Clock generation and distribution" (Tuesday morning)
- "High-speed I/O" (Tuesday afternoon)
- "Logic and systems" (Wednesday morning)
- "Next generation microprocessors" (Wednesday morning)

Imagers and MEMS

- "Image sensors" (Monday afternoon)
- "Integrated sensors and display circuits" (Tuesday morning)

Memory

- "Non-volatile and SRAM" (Tuesday afternoon)
- "DRAM" (Wednesday afternoon)

Signal Processing

- "Signal processing for communications" (Monday afternoon)



Henry Samuelli, plenary speaker at the 1999 ISSCC.

- "Signal processing for multimedia" (Tuesday afternoon)
- "Mixed signal technologies" (Wednesday morning)

Technology Directions

- "Technology directions: Emerging memory and device technologies" (Tuesday morning)
- "Technology directions: Low-temperature circuits and diagnostic techniques for microprocessors" (Tuesday afternoon)
- "Technology directions: High-frequency wireless" (Wednesday morning)
- "Technology Directions: Low-power and digital techniques" (Wednesday afternoon)

EVENING DISCUSSION SESSIONS

There are a total of eight Evening Discussion Sessions (four on Monday evening and four on Tuesday evening). The titles and moderators are listed in Table 4. ●

Moderator	Title	Day
W. Yang	"When can I buy a Dick Tracy watch for christmas?"	Monday
K. Asanovic	"Where will microprocessor performance come from in the next ten years?"	Monday
D. Robertson	"Engineering resource: Train, buy or steal?"	Monday
J. Pathak	"Memory designer: Survivor or dinosaur?"	Monday
T. Sakurai	"Can system LSI become a technology driver for the next ten years?"	Tuesday
C. Svensson	"RF and high-speed interfaces: 50 ohms or Freedom? Low-voltage differential or custom?"	Tuesday
V. Bahl	"Home networking: Wired or wireless?"	Tuesday
T. Stetzler, M. Nettles	"Nostradamus II: Technology's impact on the next millennium"	Tuesday

Table 4. Moderators and Titles of the Evening Discussion Sessions

SSCS Officer Elections: Wooley Elected President, Sodini Elected Vice President

Bruce Wooley was elected Society President for 2000–2001 and Charles Sodini was elected Society Vice President for 2000–2001. The President and Vice President are elected at the last AdCom meeting of odd-numbered year. Wooley's and Sodini's terms begin on January 1 and last for two years.

Wooley just completed two years as Vice President of the Society 1998–1999. Sodini has been Meeting Chair for the first three years of the Society, a position he held previously when the organization was still a Council.

Low Terman now assumes the office of SSCS Past President. Terman will also be serving in the Office of Technical Activities Vice President-Elect, 2000 after an Institute-wide election.

Bruce A. Wooley is a Professor of Electrical Engineering, the Director of the Integrated Circuits Laboratory, and a Senior Associate Dean of Engineering at Stanford University. He received the B.S., M.S., and Ph.D. degrees in electrical engineering from the University of California, Berkeley in 1966, 1968, and 1970, respectively. From 1970 to 1984 he was a member of the research staff at Bell Laboratories in Holmdel, NJ, and he joined Stanford in 1984. His research is in the field of integrated circuit design, where his interests include oversampling A/D and D/A conversion, low-power mixed-signal circuit design, circuit design techniques for video and image data acquisition, high-speed embedded memory, high-performance packaging and testing, noise in mixed-signal integrated circuits, and circuits for high-speed communications.

Prof. Wooley is a Fellow of the IEEE. He has served as the Editor of the IEEE Journal of Solid-State Cir-

cuits and as the Chairman of both the International Solid-State Circuits Conference and the Symposium on VLSI Circuits. He is also a past Chairman of the IEEE Solid-State Circuits and Technology Committee, and he has been a member of the IEEE Solid-State Circuits Council, the IEEE Circuits and Systems Society AdCom, the Executive Committee of the ISSCC, and the Executive Committee of the Symposium on VLSI Circuits. He is currently the Vice President of the IEEE Solid-State Circuits Society. He has published more than 100 technical articles and is a coauthor of *The Design of Low-Voltage, Low-Power Sigma-Delta Modulators*. He is a coeditor of *Analog MOS Integrated Circuits, II*.

Charles G. Sodini received the B.S.E.E. degree from Purdue University, Lafayette, IN, in 1974, and the M.S.E.E. and the Ph.D. degrees from the University of California, Berkeley, in 1981 and 1982, respectively.

He was a member of the technical staff at Hewlett-Packard Laboratories from 1974 to 1982, where he worked on the design of MOS memory and later on the development of MOS devices with very thin gate di-



Charles Sodini
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electrics. He joined the faculty of the Massachusetts Institute of Technology, Cambridge, in 1983, where he is currently a Professor in the Department of Electrical Engineering and Computer Science. His research interests are focused on integrated circuit and system design with emphasis on analog, RF, and memory circuits

and systems. Along with Prof. Roger T. Howe, he is a co-author of an undergraduate text on integrated circuits and devices entitled *Microelectronics: An Integrated Approach*.

Dr. Sodini held the Analog Devices Career Development Professorship of Massachusetts Institute of Technology's Department of Electrical Engineering and Computer Science and was awarded the IBM Faculty Development Award from 1985 to 1987. He has served on a variety of IEEE Conference Committees, including the International Electron Device Meeting, where he was the 1989 General Chairman. He was the Technical Program Co-Chairman for the 1992 Symposium on VLSI Circuits and was the 1993–1994 Co-Chairman of the Symposium. He has served on the Electron Device Society Administrative Committee from 1988–1994 and is currently a member of the Solid-State Circuits Society Administrative Committee, where he is the Meetings Committee Chairman. He is a Fellow of the IEEE. ●



Bruce Wooley
President
wooley@ee.stanford.edu

AdCom Members Elections

It is my privilege to report to you the results of the fourth annual election for membership on the Administrative Committee (AdCom) of the IEEE Solid-State Circuits Society. The margin was exceptionally close, and every candidate on the slate received very significant support from the voting membership, indicative of the recognition and respect that they

each have earned in our profession.

The following candidates have been elected: Anantha Chandrakasan, John Corcoran, Chris Mangelsdorf, Willy Sansen, and Christer Svensson. All five will take office on 1 January 2000 and will serve for a period of three

Continued on next page →

Five New AdCom Members *continued*

years as your representatives on the AdCom. Their photos and biographies are included in this Newsletter.

I thank personally, and on your behalf, all of the candidates who agreed to run for this office. Their commitment of time and effort is a statement of their interest in furthering the goals of our Society and the advancement of our profession.



Robert G. Swartz
*Nomination
Committee Chair*

IEEE Solid-State
Circuits Society
r.swartz@ieee.org



Anantha P. Chandrakasan (S'87-S'92-M'95) received the Ph.D. degree in E.E.C.S. from the University of California, Berkeley, in 1994.

Since September 1994, he has been with the Massachusetts Institute of Technology, Cambridge, and is currently an Associate Professor of E.E.C.S. His research interests include low-power implementation of DSPs, wireless sensors and multimedia devices, and emerging technologies. He is a coauthor of *Low Power Digital CMOS Design* and a coeditor of *Low Power CMOS Design* (IEEE Press, 1998).

Dr. Chandrakasan held the Analog Devices Career Development Chair from 1994 to 1997. He received Career Development Awards from NSF, IBM, and National Semiconductor. He has received several awards, including the 1993 IEEE Communications Society's Best Tutorial Paper Award, the IEEE Electron Devices Society's 1997 Paul Rappaport Award for the Best Paper in an IEEE EDS publication during 1997, and the 1999 Design Contest Award from

DAC. He has served on program committees of various conferences including ISSCC, VLSI Circuits Symposium, DAC, and ISLPED. He has served as a Technical Program Co-Chair for ISLPED'97, VLSI Design'98, and SiPS'98. He is currently a Subcommittee Chair for ISSCC and an Associate Editor of the *IEEE Journal of Solid-State Circuits*. He is a member of the DISPS Technical Committee of the IEEE Signal Processing Society.



John J. Corcoran (M'75-SM'90) received the B.S. degree in electrical engineering from the University of Iowa, Iowa City, in 1968, and the M.S.

degree in electrical engineering from Stanford University, Stanford, CA, in 1970.

Since 1969, he has been with the Hewlett-Packard Company, first at Santa Clara Instrument Division, then at Hewlett-Packard Laboratories in Palo Alto, CA, where his work has focused on integrated circuit design in bipolar, CMOS, Bi-CMOS, CCD, GaAs MESFET, and GaAs HBT technologies. He is presently Manager of the Mixed-Signal Electronics Department at HP Laboratories, which develops integrated circuits for instrumentation, communication, and computer peripheral applications. He has published numerous papers on high-speed A/D conversion and A/D testing.

Dr. Corcoran is coauthor of the paper, "A 1-GHz 6-bit ADC system," which received the Best Paper Award from the *IEEE Journal of Solid-State Circuits* for 1987-1988. He received the Best Evening Panel Award from the 1988 International Solid-State Circuits Conference (ISSCC) and the Beatrice Winner Award for Editorial Excellence from ISSCC in 1992. He has served as Guest Editor for

the *IEEE Journal of Solid-State Circuits*, and from 1994 to 1997 was Secretary of the IEEE Solid-State Circuits Council, the predecessor organization to the IEEE Solid-State Circuits Society.



Chris Mangelsdorf (S'79-M'80-S'81-M'83) received the B.S. degree in physics (magna cum laude) from Davidson College, Davidson, NC, in 1977.

He received the M.S. and Ph.D. degrees in electrical engineering from the Massachusetts Institute of Technology, Cambridge, in 1980 and 1984, respectively, where he held the Analog Devices Fellowship.

He has been associated with Analog Devices since summer employment in 1980 and is presently Senior Staff Scientist. He is currently the Director of the Japan Design Center for Analog Devices in Tokyo. His past research work included cryogenics, high-voltage dielectrics, and numerical simulation of electric field problems. His current interests are in analog integrated circuits, including high-speed analog-to-digital converter architectures, sample and holds, low-noise signal CMOS signal processing, imaging circuitry, and dynamic test techniques.

One of Dr. Mangelsdorf's ADC products received a vendor award from Hewlett-Packard and was voted one of the EDN Magazine's "Best Products of 1988." He is a member of Phi Beta Kappa and Sigma Pi Sigma (physics). He has served on the Program Committee for ISSCC for five years and the Bipolar Circuits and Technology Meeting for four years. He has organized and moderated three ISSCC panels in the last five years and received the 1993 Best Panel Award for "The future role of the analog designer."



Willy Sansen (S'66–M'72–SM'86–F'95) received the M.S. degree in electrical engineering from the Katholieke Universiteit (K.U.) Leuven, Leuven, Belgium, in 1967, and the Ph.D. degree in electronics from the University of California, Berkeley, in 1972.

He has been a Visiting Professor at the universities of Stanford (1977), Lausanne (1981), Philadelphia (1985), and Ulm (1994). Since 1981, he has been Full Professor at the ESAT laboratory of the K.U. Leuven. From 1984 to 1990, he was the Head of the Electrical Engineering Department. He has been involved in design automation and in numerous analog integrated circuit designs for communications, consumer electronics, medical applications, and sensors. He has been supervisor of 38 Ph.D. dissertations in this field and has authored or coauthored eight books and over 500 papers in international journals and conference proceedings.

Dr. Sansen is cofounder and organizer of the AACD (Advances in Analog Circuit Design) workshops and is a member of the executive/program committees of the ISSCC.



Christer Svensson (M'96) was born in Borås, Sweden, in 1941, and received the M.S. and Ph.D. degrees from Chalmers University of Technology, Sweden, in 1965 and 1970, respectively.

He was with Chalmers University from 1965 to 1978, where he performed research on MOS transistors, nonvolatile memories, and gas sensors. He joined Linköping University in 1978, and since 1984, he has been Professor in Electronic Devices. He served as Vice Dean of the Technical Faculty at Linköping University from 1990 to 1996. At Linköping, he initiated a new research group on integrated circuit design. His present interests are high-performance and low power

analog and digital CMOS circuit techniques for computing, signal processing, and sensors. He has published more than 140 papers in international journals and conferences and holds ten patents. He was cofounder of the spinoff companies Varilab AB (1977), Sensistor AB (1981), SiCon AB (1984), and SwitchCore AB (1997).

Dr. Svensson was awarded the IEEE Solid-State Circuits Council Best Paper Award for 1988–1999. He is a member of the Royal Swedish Academy of Engineering Sciences, served on the board of the Swedish Research Council for Engineering Sciences from 1995 to 1998, and is a member of the Board of the Technology Bridge Foundation in Linköping. He is presently Associate Editor of the *IEEE Journal of Solid-State Circuits*. He is serving on various program committees: International Solid-State Circuits Conference (ISSCC), European Solid State Circuit Conference (ESS-CIRC), and International Symposium on Low-Power Electronic Design. ●

Call for Fellow Nominations Deadline 15 March 2000

The grade of Fellow is one of exceptional distinction, conferred by the IEEE Board of Directors on members who have significantly contributed to their technical field. The number of SSCS members nominated for Fellow this past year was well below that for other IEEE societies of comparable size. As a society, we simply are not doing an adequate job of recognizing the very significant contributions our members have made to our profession.

The Fellow nomination process is relatively straightforward but requires some forethought and planning preceding the 15 March 2000 deadline. At least five references from current Fellows are required. If the nominee has not applied for Senior Member status, that application and its three supporting references must be submitted no later than 4 February 2000. Senior Member forms can be emailed or completed online.

Email:
Senior-member-forms@ieee.org
URL:
www.ieee.org/organizations/rab/md/smforms.htm

Fellow kits can be requested in hard copy format or downloaded from the Web.
Fax: (732) 981-9019
Email: fellow-kit@ieee.org
URL:
www.ieee.org/about/awards/table1.htm ●

Complete JSSC CD/DVD Archive Being Issued

This coming February, the complete digital archive of the JSSC will be available. This series will be complete back to the first issue of the *Journal*. It will provide a convenient, searchable, desktop research tool for circuit designers, technical historians or students. The Archive includes:

- A master index in CD-ROM format of the 1966–1998 issues
- CD-ROMs of 1966–1988 issues
- A DVD of all 1966–1998 issues
- A softcover album in which to keep the entire collection

In previous years, the Society issued CD-ROMs of 1989–1998, which are still available separately. See the ad below.

Both the CD-ROM and DVD formats are provided together at this

time for a convenient transition between platforms. DVD users can search with the master index that comes on the DVD, which links directly to the articles. CD-ROM users can search all 33 years of issues on the master index. Then insert the selected year CD and select the author or title to link to and view the article. There are no hyperlinks between CD disks in this series.

This digital archive provides “Search” capabilities through Acrobat Reader. This is a powerful additional function to the common use of Reader for viewing documents. As with the previously issued CD-ROMs, it is necessary to load an enhanced version of Acrobat Reader rather than a single plug-in. With the collection issued this year, Acrobat Reader 4.0 will be included. Once loaded, it will be backward

compatible and capable of reading all of the JSSC article files on all of the CDs and the DVD no matter what year they were issued. Certain “Preferences” need to be correctly set. There are “Search” and “Getting Started” buttons provided to access more details.

There will also be SSCS and conferences buttons linking to Web pages for information on upcoming conferences, calls for papers, and other Society news.

The SSCS will continue to issue an annual CD each May to update the electronic archive of the *Journal* with the preceding year’s articles. The Society is also looking forward to the day when this archive can be accessed on-line and linked to other IEEE technical publications. ●

Major Actions at the August AdCom Meeting

Budget

The SSCS Administrative Committee (AdCom) approved the year 2000 budget. Before inclusion of any capital appreciation of the reserves, the budget shows a negative bottom line of \$24.5 thousand with expenses of approximately \$2.7 million. The 2000 budget meets the IEEE mandated requirement of improvement of the bottom line over 1999 by 3% of the 1999 expenses after meeting expenses have been removed.

The AdCom funded a number of new initiatives and continued ongoing programs.

Archival CD-ROMs

The AdCom approved two archival CD-ROM sets, which will be of great interest to SSCS members and the solid-state circuits community in general:

- The *Journal of Solid-State Circuits* CD-ROM/DVD set—A new CD-ROM set will cover the JSSC issues from 1966 to 1988. The set will also include a single DVD covering all issues of the *journal* from 1966 to 1998. (see the preceding “Complete JSSC CD/DVD Archive” on the facing page).
- ISSCC Digest CD-ROM/DVD Set—A complete archival set of all ISSCC Digests, going back into the mid-1950s, when it was known as the Transistor Circuits Conference, was also approved. It will cover the four-and-a-half decades of the ISSCC. The target date for availability is the 2001 ISSCC, and it will be issued in both CD-ROM and DVD formats.

ISSCC Short Course CD-ROM

A CD-ROM of the ISSCC 2000 Short Course on *Circuits and Devices for RF Wireless Networks* was approved and is being prepared. It will be offered to those who attend the short course at ISSCC and will also be available to nonat-

tendees at a price approximately equal to the registration for the short course. Look for announcements in future newsletters.

IEEE Sensors Council

The AdCom voted for the SSCS to become member of the new IEEE Sensors Council, the formation of which was approved by the IEEE Technical Activities Board earlier this year. The Sensors Council will be involved in the theory, design, fabrication, manufacturing, and application of devices for sensing and transducing physical, chemical, and biological phenomena, with emphasis on the electronics, physics, and reliability aspects of sensors and integrated sensor-actuators. SSCS representatives are Bernhard Boser from the University of California at Berkeley and Johan Huijsing from Delft University of Technology, Netherlands.

Chapters Funding

Fourteen chapters applied for and received funding for their projects. See “Chapters News” on page 12 for a detailed report. Additional funding has been set aside for requests from any new chapters that form during the year.

Meetings Committee:

The AdCom approved technical cosponsorship of six meetings in 2000:

1. VLSI Technology Symposium
2. Asia-Pacific Application-Specific Integrated Circuits (AP-ASIC)
3. European Solid-State Circuits Conference (ESSCIRC)
4. Bipolar/BiCMOS Circuits and Technology Meeting (BCTM)
5. GaAs IC Symposium
6. Symposium Southwest Symposium on Mixed-Signal Design

Practices for reviewing and evaluating technical meetings sponsored

by the Society are being developed. Meeting metrics, including the number of attendees, speakers, papers submitted, and papers accepted will continue to be collected. A questionnaire will be developed to poll how attendees of a meeting view its quality. The meetings committee is interested in working with meeting leadership to achieve the goals of each meeting.

New Member Promotions at Meetings

A promotion for new IEEE and Society members at the ISSCC was approved. Registrants at ISSCC at the nonmember rate will be able to receive a free six-month membership in the IEEE, SSCS, and the Electron Devices Society by filling out an application form at the meeting. This is one of several very successful cooperative membership promotions with EDS; new cooperative membership promotions with other IEEE societies are being investigated.

SSCS Life Members

Although approximately 175 members of the SSCS are IEEE Life Members, they do not qualify for Life Membership in SSCS because the Society is less than five years old, and the IEEE Bylaws require five years of membership in a society to qualify for society Life Member status. The AdCom has decided to rectify this situation. The SSCS will simply fund the Society membership for IEEE Life Members who have been SSCS members for all three years of its existence. Vouchers to enable this were enclosed in IEEE renewal mailings to those members who qualify.

Next AdCom

The next AdCom meeting is scheduled for Sunday 6 February, preceding the ISSCC.

For the complete minutes and attached reports, visit the SSCS Web site at www.sscs.info.minutes. ●

Call for the Nomination of Administrative Committee Members

In accordance with its Constitution, the IEEE Solid-State Circuits Society invites members of our Society to nominate candidates for the Society's Administrative Committee (AdCom).

Nominees by Petition

Nominees will automatically be placed on the ballot provided:

- The nominee is presently a member of the IEEE Solid-State Circuits Society.
- The petition is supported by at least ten identifiable signatures of present members of the Society.
- The nominee is both aware of and agrees to the petition.
- The petition is received by the Chair of the Nominations Committee by 1 May 2000.

Terms of Office

- The term of office is three years beginning 1 January 2001.
- AdCom members may be reelected to a second consecutive term.
- The five nominees receiving the highest number of votes from the society membership will be elected.

Scope

Elected AdCom members can expect to attend at least two yearly meetings. In addition, much of the Committee work is carried on by email, telephone, and fax throughout the year. The Solid-State Circuits Society currently sponsors *The Journal of Solid-State Circuits*, *The International Solid-State Circuits Conference*, *the Custom Integrated Circuits Conference*, *the VLSI Cir-*

cuits Symposium, and the Solid State Circuits and Technology Committee's workshops. In addition, the Society cosponsors or technically cosponsors a number of other conferences and meetings.

The AdCom has responsibility for the overseeing of these and other potential future technical activities within the Society's field of interest.

Mailing Petitions

All petitions should be accompanied by a personal photograph and a short biography (200 words or less) including areas of interest. Petitions must be received by 1 May 2000. Petitions are to be mailed to:

IEEE SSCS Executive Office
445 Hoes Lane
Piscataway, NJ 08855-1331 ●

The IEEE Solid-State Circuits Society Predoctoral Fellowship for 2000–2001

The IEEE Solid-State Circuits Society is offering a predoctoral fellowship in solid-state circuits for the academic year 2000–2001. The fellowship includes a stipend of \$15,000, tuition and fees up to a maximum of \$8,000, and a grant of \$2,000 to the department in which the recipient is registered.

Applicants must have completed at least one year of graduate study, be in a Ph.D. program in the area of solid-state circuits, and be a member of the IEEE. The award will be made on the basis of academic record and promise, graduate study program, and need.

An application should include these items:

- Academic records—Copies of all relevant undergraduate and graduate transcripts.
- Graduate study plan—This should include a summary of what has been completed and what is planned (about two pages is appropriate). Please include a list of any publications authored or coauthored. A copy of each publication is desirable. Please explain the work to be completed in the remainder of your graduate study program, why you think it is important, and what is novel about your approach. Finally, indicate how important it is for you to receive this support.
- Letters of recommendation—At least two letters of recommendation are required; one should be from the principal adviser. These

letters should address academic record, accomplishments and promise, graduate study research program, and need.

The deadline for submission is 15 May 2000, and the results will be announced by 15 July 2000.

Nominations should be sent to:

Richard C. Jaeger, Chairman
Solid-State Circuits Society
Awards Committee
Alabama Microelectronics Center
Electrical and Computer
Engineering Dept.
420 Broun Hall
Auburn University, AL 36849
Tel: +1 334 844 1871
Fax: +1 334 844 1888
Email: jaeger@eng.auburn.edu ●

SSCS Membership Statistics

With the beginning of a new millennium approaching, here's a wrap-up of the IEEE Solid-State Circuits Society membership. Figure 1 shows active membership in the Solid-State Circuits Society since the beginning as a society to September 1999. The dips in the curve each February are from people in Regions 1-6 being dropped for not renewing their memberships, and again in April, when people are dropped in Regions 7-10 for not renewing. Don't be part of the dip; renew your membership now, if you haven't done so already, to avoid interruption of membership.

Figure 2 shows what regions SSCS members are located in. The United States is broken into Regions 1-6, Canada is Region 7, Europe is Region 8, Latin America is Region 9, and Asia and the Far East are Region 10.

Figure 3 outlines the breakdown of IEEE grade for SSCS members.

Figure 4 gives an indication of what other affiliations and interests our members have. The chart shows the percentage of members of each IEEE society who are also in the SSCS, along with the percentage of SSCS members also in other IEEE societies.

Congratulations are extended to the following SSCS members for their recent promotion to IEEE Senior grade:

Subhomoy Chattopadhyay
Edward M Godshalk
Madjid E. Hafizi
G. Dan Hutcheson
Sang-Soo Lee
Christopher A. Looby
Kartikeya Mayaram
Damien J. McCartney
Un-Ku Moon
K. Nakamura ●

Bart Nauwelaers
Shinji Okazaki
Indumini W. Ranmuthu
Sachin Sapatnekar
Sorin G. Stan
Donald C. Thelen, Jr.
Chris Toumazou
Pan Wu
Rajesh H. Zele



Steve Kosonocky
Membership Chair

IEEE Solid-State
Circuits Society
stevekos@
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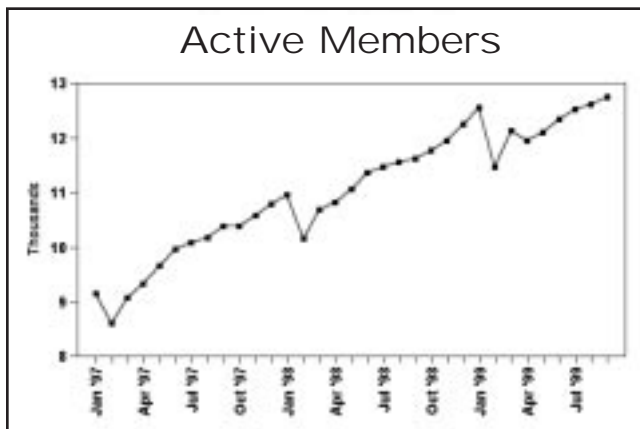


Figure 1.

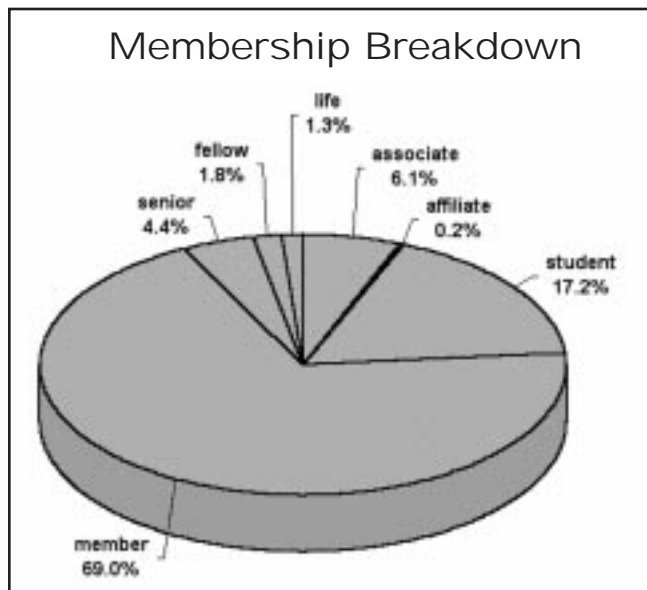


Figure 3.

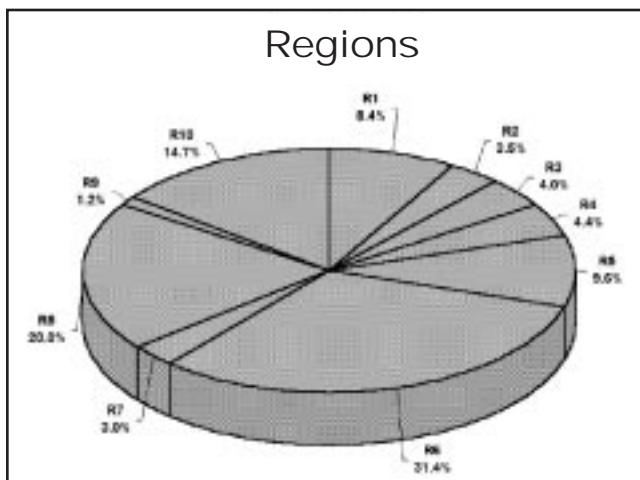


Figure 2.

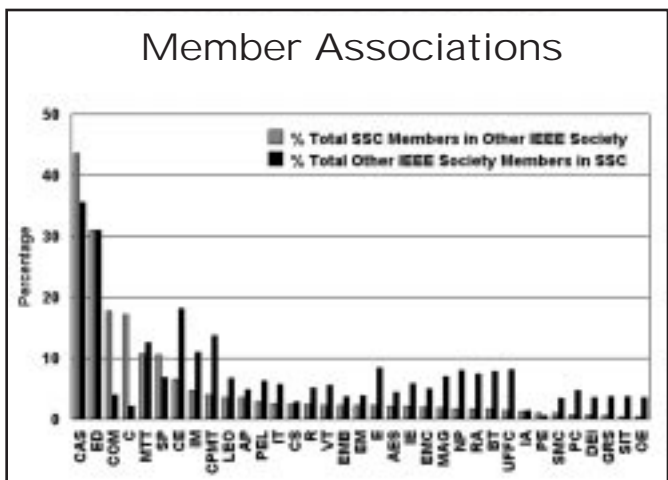


Figure 4.

Overview of AP-ASIC'99

The first IEEE Asia-Pacific Conference on ASICs (AP-ASIC'99), hosted by IEEE ED/SSC Seoul Chapter, was held 23–25 August 1999 at Yonsei University, Seoul, Korea. The objective of AP-ASIC was to promote research and development activities in solid-state circuits within IEEE Region 10 countries. The conference will be held biannually every even-numbered year, except for the inauguration year of 1999. During AP-ASIC'99, the international steering committee members have been elected unanimously; Chairman, Prof. Moon-Key Lee (Korea); Vice Chairmen, Dr. Hajime Ishikawa (Japan) and Prof. Chong-kuang Wang (Taiwan); and Secretary, Prof. Kwang S. Yoon (Korea).

AP-ASIC'99 featured a half-day tutorial session, two keynote speeches, two invited papers, and 102 paper presentations (91 papers in 21 regular sessions and 11 papers in four special sessions). The total number of registrants from 10 countries (Korea, Taiwan, United States, Japan, Australia, Singapore, Canada, Portugal, Germany, and Macao) was 198, including 43 tutorial attendees. The half-day tutorial session covered topics on Advanced Memory and CDMA systems. Two keynote speakers in the plenary session, Dr. Hyung-Kyu Lim (Samsung Electronics Co., Korea) and Dr. Nicky Lu (Etron Technology, Inc., Taiwan) talked about semiconductor memories in the year 2001 and beyond and about trends in the IC industry in the 21st century, respectively. Two invited papers on Associative Memory and Neural Circuits were given by Dr. Komatsu Asada (University of Tokyo, Japan) and Dr. Chung-Yu Wu (National Chiao Tung University, Taiwan). The four special sessions featured Merged Memory with Logic (six papers) and ASIC for Mobile Communication Systems (five papers).

The 21 regular sessions included:

- Amplifiers & Filters I/II (nine papers)
- Communication Circuits (five papers)
- Microprocessors & Microcontrollers I/II (seven papers)
- Wireless & Optical Receivers (five papers)
- Sensor/Imagers/Mems Circuits (five papers)
- Multimedia Processors (four papers)
- Low Voltage & Low Power Circuit Technique (five papers)
- Data Converters (five papers)
- Signal Processing Circuits I/II (ten papers)
- Microprocessors & Design Reuse (five papers)
- Oversampling Converter & Neural Network (four papers)
- Design Reuse & IP (four papers)
- PLL & New Technologies I/II (eight papers)
- Design for Testability I/II (nine papers)
- Digital Circuits (four papers)
- Digital Circuits & Display Drivers (four papers)

A paper of special interest in the Microprocessor and Microcontroller session was entitled “A fail-safe microprocessor using dual synthesizable processor cores,” by Kotaro Shimamura et al., Hitachi, Japan. It illustrated the design of processor core by using full custom and synthesizable approaches. Comparisons were made between these two approaches. Another paper, entitled “Semi-folded instruction format for VLIW architecture,” by Won-Kee Hong et al., Yonsei University, Korea proposed a semi-folded instruction format for VLIW architecture and benchmarked the format by comparing cache miss rate for five different cache architectures. In the Microprocessors and Design Reuse session, another paper of note, entitled “A dual issue queued pipelined Java processor TRAJA—Toward an open



AP-ASIC Organizing Committee Members with Conference participants at Yonsei University, Seoul Korea.

source processor project,” was presented by Naohiko Shimizu et al., University of Tokai, Japan.

During AP-ASIC'99, the IEEE SSCS membership drive desk was set up next to the on-site registration desk. The SSCS special membership promotion program that was offered enabled 30 students to participate in AP-ASIC'99.

AP-ASIC 2000

The Asia-Pacific Conference on ASICs 2000 (AP-ASIC 2000) will be held in Cheju, Korea, 28–30 August 2000. The AP-ASIC 2000 Program Committee invites contributions in the areas of Analog Circuits, Digital Circuits, Communication Circuits, Memory Circuits, Microprocessors, Signal Processing Circuits, Design Reuse and IP, Sensor and Image Circuits, MEMS Circuits, and Design for Testability and Yield. Prospective authors should submit a file in pdf format, camera-ready, about four pages in length, in double columns. Electronic submission is the only acceptable format. Email the pdf file directly to asic2000@ap-asic.org to be received by 31 March 2000. For more update information, please visit the Web site at www.ap-asic.org. ●

Kwang S. Yoon
Secretary, IEEE Seoul Chapter
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Conference proceedings with CD-ROM (IEEE Cat. No. 99EX360, ISBN: 0-7803-5705-1) are available from the IEEE (Email: customer-service@ieee.org).

Looking Back on ESSCIRC'99

The 25th anniversary of the European Solid-State Circuits Conference (ESSCIRC'99) was held 21–23 September 1999 in Duisburg, Germany. The conference featured a total of 110 papers: eight invited talks, 63 regular papers presented orally, and 39 posters. The following is a brief summary of some of outstanding ESSCIRC'99 papers.

Analog

Among the numerous papers on analog circuits, two papers of special interest could be found. Paper 1.3.3, "A low-power BiCMOS op amp with integrated current mode charge pump," by R. St. Pierre, featured an operational amplifier that consumes only 4 μA at 2.4–5.5 V power supply range while operating rail-to-rail. The current mode charge pump appears to be superior to the voltage mode charge pump usually used. In Paper 2.2.1, S. L. J. Gierkink et al. discussed how to reduce $1/f$ -noise and power dissipation of MOS transistors using "switched-bias." This technique relies on on/off-switching of a MOSFET bias, thus making it periodically operate in a mode of strong inversion and accumulation. Measurements of a CMOS oscillator employing this technique have confirmed noise and power reduction according to the theory.

Modeling

Paper 2.6.1 was devoted to the modeling of digital substrate noise. M. van Heijningen et al. have developed a SPICE substrate model that makes it easy to evaluate substrate noise and its impact on circuit performance. The validity of the model has been corroborated by measurements of realized circuits.

Oscillators

In Sessions 2.7 and 2.8, two papers on VCOs were presented that received wide attention. The first contribution, Paper 2.7.2 by A.M. Niknejad et al., outlined design and integration of two low-phase noise VCOs operating at 2.9 GHz and 4.4 GHz. They were implemented in an

$f_t = 25$ GHz bipolar process. In Paper 2.8.2, De Muer et al. introduced a 2 GHz LC-VCO, also with low-phase noise. Fabricated in a $0.65\mu\text{m}$ BiCMOS process, it employs integrated planar inductors. In addition, the flicker noise upconversion factor has been optimized to ensure low noise.

Mixed-Signal

Mixed-signal circuits are presently receiving wide attention. In Paper 3.1.1, "Microelectronic components for a retina implant system," S. Kolnsberg et al. showed design and realization of components for a retina implant system that provides visual sensations to blind patients. These include a miniature CMOS camera with 140 dB dynamic range, an implantable power and data receiver, and a stimulator chip with integrated electrodes. Paper 3.3.1 by C. Rooman et al. described an asynchronous 250 Mb/s optical receiver with integrated photodetectors in standard $0.6\mu\text{m}$ CMOS technology. It features 10 channels, while one channel is used as reference. Each channel contains a spatially modulated light detector and a low offset receiver.

Image Sensors

In Session 3.4, two papers were presented that feature interesting

image sensors. The first, Paper 3.4.1 by S. Benthien et al., employed an amorphous silicon thin film used as a photodetector that is deposited on an ASIC implemented in standard CMOS. Two imagers have been implemented: one with local autoadaptation for digital photography and a second one with high dynamic range for automotive applications. In Paper 3.4.2, M. Sanchez et al. presented a CMOS imager in standard technology that is also intended for use in automotive applications. The high dynamic range has been achieved due to the use of the multiexposure principle and gain control.

Summary

ESSCIRC'99 was a highly successful conference. It remains an important annual forum for European engineers and scientists working in the area of microelectronic circuit design and continues to attract more and more participants from overseas. ●



Prof. B. J. Hosticka
ESSCIRC'99
Technical Program
Chair

ESSCIRC 2000



KUNGL. TEKNISKA HÖGSKOLAN

The European Solid-State Circuits Conference (ESSCIRC) 2000 Program Committee invites contributions for the 19–21 September conference in Stockholm, Sweden in the areas of analog, digital, and mixed analog digital solid-state circuits and in closely related topics. ESSCIRC 2000 will have three parallel sessions with selected papers, separate poster presentations, and invited papers in plenary sessions.

Prospective authors should submit electronically. Papers must be received by 7 April 2000.

For further details see www.esscirc.org/esscirc2000/, "Format of Papers."

If electronic submission is not possible, please contact:

Herbert Gruenbacher
ESSCIRC 2000
Carinthia Tech Institute
Richard-Wagner-Strasse 19
A-9500 Villach, Austria
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Fax: +43 4242 2004-179

Chapters News

I am delighted to begin this issue's column by reporting that the number of global SSCS chapters continues to grow. Since the last newsletter report, we have had five additions to the list: West Switzerland (C. Enz, Chair), Beijing (Z. Wang), Scotland (J. J. Brown), Los Angeles (A. Abidi), and Bulgaria (V. M. Mladenov). This brings our collective strength to 24, broken down in the following geographical distribution: seven chapters in Regions 1–6, two in Region 7, ten in Region 8, four in Region 10, and a student chapter in Iran.

As you can see, this brings us all the closer to our goal of having 50 established chapters in four years' time. With the interest brewing in new chapter formation, I am confident that I will have more additions to announce very soon.

In August, the Administrative Committee approved a total of \$12,350 in new subsidies to 14 chapters. The recipients, including chapters from across the globe, such as Baltimore, Boston, Chicago, Dallas, Finland/Estonia, Montreal, Novosibirsk, Novgorod, Seoul, Taipei, Yugoslavia, and Zurich, were awarded individual amounts of up to \$1,000 for a wide spectrum of purposes—membership drives, Web site creation and maintenance,

student publications, and the funding of professional lectures and workshops.

The fourth annual joint IEEE Divisions I and IV, Region 8 Chapters Meeting was held 12 September in Leuven, Belgium in conjunction with the European Solid-State Device Research Conference (ESSDERC). Sixty attendees, representing 9 societies and 43 chapters from 25 countries, were in attendance. The meeting was a useful opportunity for the different societies to share status reports and to discuss membership development practices and the wider strategic objectives of the group. One of the highlights was a presentation by Mike Lightner on the present practice and future goals of the IEEE's electronic products division, with a lively question-and-answer session on members' electronic access to publications. There was a preliminary proposal to hold the next Chapters Meeting in Paris in October 2000. Four SSCS chapter representatives gave chapter reports and shared their advice on best practices with the participants. M. Peter Kennedy (U.K. and R.I.) gave an overview of the history of the microelectronics industry in Ireland and explained how corporate sponsorship has helped his chapter with organizing events and increasing membership. Aleksander Jaksic (ED/SSC, Yugoslavia) reported on the MIEL conference that his chapter cosponsored and on initiatives to develop membership in the region. Victor Turchin (MTT/ED/A/CPMT/SSC, Nizhny Novgorod) and Eiko Kangsep (CAS/SP/SSC, Finland/Estonia) both shared



Professor Shi-Hua Wang (Beijing Chapter Chair), Jan Van der Spiegel, and Dr. Wang's assistant outside the gates of Tsinghua University.

their experiences of organizing several successful events last year.

The EDS/SSCS Seoul Chapter has been selected as the 1999 recipient of the IEEE Electron Devices Society Chapter of the Year Award. The award, which is given to those chapters that have particularly excelled in the quantity and quality of their programs and activities, is a recognition of the Seoul Chapter's significant accomplishments this past year. They were responsible for organizing four IEEE Distinguished Lectures, gave two best student paper awards, sponsored a further six best paper awards at the CAD and VLSI conferences of the IEEK (Institute of Electronic Engineering of Korea), and organized the first IEEE Asia-Pacific Conference on AP-ASICs. My congratulations to the Chapter's Chair, Professor Moon K. Lee, and to all the members.

In a similar vein, the SSCS plans to introduce its own outstanding chapter award, a proposal for which will be presented for approval to the AdCom at its February meeting. Further developments will be announced.

Finally, I had the pleasure in June of visiting the People's Republic of China and finding out how chapter formation is progressing there. Dr. Shi-Hua Wang of Tsinghua University's Electrical Engineering Department was



SSCS chapter chairs met in September at an IEEE Region 8 meeting in Leuven, Belgium. L-r: Jan Van der Spiegel, Aleksander Jaksic (Yugoslavia), M. Peter Kennedy (U.K./R.I.), Eiko Kangsep (Finland/Estonia), Alexander Gridchkin, (Student Chapter, Novosibirsk, Russia), and Victor Turchin (Nizhny Novgorod, Russia).

my gracious host in the Chinese capital, and I was very impressed by the quality of the design facilities and student projects that I saw. Dr. Wang was enthusiastic about the creation of a SSCS Beijing Chapter, and indeed since my visit that chapter—the first in P.R. China—has been formed. I also had the opportunity to travel to Fudan University and the Shanghai Institute of Metallurgy during my visit and saw the equally impressive lab facilities of both institutions. I am confident that a new or joint SSCS chapter will be formed in the Shanghai area in the near future. ●



Jan Van der Spiegel
SSCS Chapters
Coordinator

IEEE Solid-State
Circuits Society
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Dallas Chapter

Paul Yin Hu, Chapter Chair

The first meeting of the IEEE SSCS Dallas Chapter was held 16 September at the Forest Lane Auditorium of Texas Instruments. The Chapter Chair, Paul Yu, opened the meeting with an introduction and remarks about the SSCS Dallas

Chapter, which was formed in March 1999. The meeting featured a talk entitled “Low voltage analog CMOS circuit techniques,” by Dr. John Fattaruso of Texas Instruments. Dr. Fattaruso reviewed the limitations of analog CMOS circuit design as technology and power supply are scaled and then reviewed various circuit techniques to design CMOS switches, op amps, and bandgap reference circuits at power supplies of 2.5 V and less. The talk was well received by the 41 attendees.

Dr. Wai Lee of Texas Instruments spoke on “Low power DSP for wireless communications” at the chapter’s second meeting 20 October.

At the time of this writing, a November meeting was planned, with Dr. Ajith Amerasekera of Texas Instruments presenting “An overview of ESD protection circuits for ICs.”

The SSCS Dallas Chapter plans to feature various talks at monthly meetings. The chapter welcomes its members to suggest topics and speakers. Any questions and suggestions can be sent to pauly@ti.com.

New SSCS Chapter in Scotland

Jim Brown, Chapter Chair

The inaugural meeting of the Scottish Chapter of the IEEE Solid-State Circuits Society was held at Cadence Design System’s new \$16M semiconductor design center at Livingston’s Kirkton Campus. Fifty engineers representing companies from around Scotland and academia attended the meeting. The following people were elected to serve on the organizing committee for the next year: Jim Brown, Chair (Cadence); Frank Fattorri, Vice Chair (Semtech); Jane Jackson, Treasurer/Secretary (Wolfsan Microelectronics); Prof. Steve Beaumont, Student Activities Coordinator (System Level Institute); and Douglas Chisholm, System on a Chip Activities Coordinator (Cadence).

Continued on next page →

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Willy Sansen
Christer Svensson

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Eby G. Friedman
Representative to CAS from SSCS
T.R. Viswanathan
Region 9 Representative
Sergio Bampi

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Chapters	Jan Van der Spiegel
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Meetings	Mark Horowitz
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page: www.sscs.org/info/

For questions regarding Society business, contact the SSCS Executive Office.

Contributions for the April issue of the newsletter must be received by 19 January at the SSCS Executive Office.

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SSCS EVENTS CALENDAR

2000 ISSCC International Solid-State Circuits Conference

www.isscc.org
7-9 February 2000
San Francisco Marriott Hotel, San Francisco, CA USA
Paper submission deadline: passed
Contact: Courtesy Associates
Washington, DC
Tel: +1 202 331 2000
Fax: +1 202 331 0111
Email: ISSCC@courtesyassoc.com

1999 SSCTC Workshop Workshop on Design for Multi-Gigahertz Processors

www.sscs.org/ssctw/feb00/
6 February 2000
San Francisco Marriott Hotel, San Francisco, CA
Contact: Suzanne Demarie
Courtesy Associates
Washington, DC
Tel: +1 202 331 2000
Fax: +1 202 973 8722
Email: SSCTC@courtesyassoc.com

2000 CICC Custom Integrated Circuit Conference

www.his.com/~cicc/
21-24 May 2000
Caribe Royale, Lake Buena Vista, FL, USA
Paper deadline: passed
Contact: Ms. Melissa Widerkehr
Widerkehr & Associates
Gaithersburg, MD
Tel: +1 301 527 0902
Fax: +1 301 527 0994
Email: cicc@his.com

2000 Symposium on VLSI Circuits

www.bcasj.or.jp/vlsi_sym/
12-17 June 2000
Hilton Hawaiian Village, Honolulu, HI USA
Deadline for receipt of summaries: 7 January 2000
Contact: Ms. Melissa Widerkehr
Widerkehr & Associates
Gaithersburg, MD
Tel: +1 301 527 0902
Fax: +1 301 527 0994
Email: vlsi00@aol.com
Contact: c/o Academic Societies, Japan
Business Center, Conference Dept.
5-16-9 Honkomagome, Bunkyo-ku
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workshop is directed to practicing professionals in the microelectronics field as well as to upper-level and graduate students.

For further information, contact:
Dr. J. Varrientos, Chairman
www.seas.smu.edu/orgs/cas/

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Technical information:

Dr. Gabriele Manganaro
Texas Instruments, Inc.
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gabriele.manganaro@ieee.org ●

Events Calendar *continued from page 16*

Technically Cosponsored Meetings

2000 Southwest Symposium on Mixed-Signal Design

www.ece.arizona.edu/conferences/ssmsd
28–29 February 2000
San Diego, CA USA
Contact: Timothy Holman
University of Arizona
Tucson, AZ
Tel: +1 520 621 6097
Fax: +1 520 621 8076
Email: holman@ece.arizona.edu

BCTM: IEEE Bipolar/BiCMOS Circuits and Technology Meeting

www.snf.stanford.edu/Conferences/BCTM
24–26 September 2000
Minneapolis Marriott City Center
Minneapolis, MN USA
Contact: Janice Jopke
CCS Associates
Eden Prairie, MN
Tel: +1 612 934 5082
Fax: +1 612 934 6741
Email: jopke@aol.com

AP-ASIC

Asia-Pacific Conference on ASICs

www.ap-asic.org
28–30 August 2000
Cheju, Korea
Deadline for submission of camera-ready pdf papers:
31 March 2000
Contact: AP-ASIC'00
Research Institute of ASIC Design
Yonsei University, Seoul, Korea
Tel: +82 2 361 3523
Fax: +82 2 364 8162
E-mail: asic2000@ap-asic.org

GAASIC

Gallium Arsenide Integrated Circuits Symposium

www.gaasic.org
5–8 Nov 2000
Westin Hotel, Seattle, WA USA
Paper deadline: 12 May 2000
Contact: James J. Komiak
Sanders, A Lockheed Martin Co.
Nashua, NH
Email: james.j.komiak@lmco.com

ESSCIRC 2000

European Solid-State Circuits Conference

www.eescirc.org
19–21 September 2000
Kista Technology Park, Stockholm, Sweden
Paper deadline: 7 April 2000
Contact: Hannu Tenhunen
Royal Institute of Technology
Kista, Sweden
Tel: +46 8 752 1142 +46 70 733 5748
Fax: +46 8 752 1140
E-mail: hannu@ele.kth.se



The keynote speech was given by Dr. Gyurcsik, who *is a past Associate Editor of the IEEE Transactions on Semiconductor Manufacturing* and a member of Tau Beta Pi, Eta Kappa Nu, and Sigma XI. He has authored over 90 research publications, is the editor of one book, and holds three patents. The talk was entitled "Economic factors driving IC design or 'Pulp microelectronics'." His presentation was enthusiastically received.

Scotland is fast becoming a hub for analog circuit design, following the establishment of the Institute of System Level Integration and the Virtual Component Exchange at the Alba Centre in Livingston, 15 miles west of Edinburgh. The companies with IC design centers in Scotland include National Semiconductor, Level 1, Septet, Micro Linear, Cadence Design Systems Limited, Wolfson Microelectronics, Vision, Memory Corporation, and Allegro. It is hoped that the establishment of an SSCS chapter in Scotland will further increase the drive toward semiconductor design in that country.

Sharif University of Technology Student Chapter, Iran

*By Saeed Chehrazai and
Majid Gharghi*

An Introduction to Photonics Workshop

The IEEE Student Branch of Sharif University of Technology held an introductory workshop on photonics 20–21 September, jointly sponsored by the Communications

and SSCS Chapters of the branch. The decision to hold a workshop was made in March, and the real work began in June during the summer holidays. Funding needs were considered in parallel with identifying lecturers who were all professors at Sharif University of Technology. A funding committee was formed with the results that Basamad Azma Co., Micromodje Industries Co., and Signal Co. agreed to be cosponsors. A Web site was designed for the workshop that gave complete information about the workshop itself, the workshop's program, the timetable of the lectures, resumes of the lecturers, registration fee, list of sponsors, and the executive committee of the workshop. In September, the lecturers provided their articles and a 281-page proceedings of the workshop was published. The proceedings, made available to registrants at the workshop, included a collection of IEEE articles and selected parts of books and articles authored by the lecturers. As the workshop neared, another committee was formed to make the transparencies for the lecturers.

At the opening ceremony, the chairman of the Department of Electrical Engineering presented a brief overview of the history of communications and electronics. Then the chair of the Student Branch reported the activities of the

Branch and explained the philosophy behind such workshops.

During the two-day workshop, three professors were invited to give lectures on 11 main topics of photonics. The interesting point about the event was the different approaches of the three lecturers to the main subject. Dr. H. Kaatuzian, introducing an optical viewpoint, presented lectures about fundamentals of laser, optical amplifiers, modulators and filters, optical processing and non-linear optics. In contrast, Dr. B. Rashidian, who is an expert in IC fabrication and optical integrated circuits, discussed some topics from this point of view. Grating, guided wave optics, and MOEMS were the topics of his lectures. The third lecturer, who spoke on optical fibers, optical receivers based on photon counting and WDM optical networks, was Dr. J. Salehi, whose presentations were mainly based on communications concepts and formulations.

More than 150 students from different universities and some 30 expert engineers from industrial companies attended the sessions of the workshop. Students and faculty members from both the Physics Department of Sharif University of Technology as well as those of EE Department were well represented. ●

Of Interest to SSCS Members

2000 IEEE Dallas Workshop on Low Voltage/Low Power Circuits and Systems

The 2000 IEEE Dallas Workshop on Low Voltage and Low Power Circuits and Systems is being conducted on 27 March under the aegis of the Dallas Chapter of the Circuits and Systems Society. Tutorial sessions and panel discussions presenting the latest techniques and

challenges involving low power and low voltage circuit and system design will be given by leading experts in the field, such as Prof. E. Sanchez-Sinencio (Texas A&M University) and Prof. M. Ismail (Ohio State University). Some of the topics that will be covered are design of low power wireless circuits, design of low voltage analog circuits, and low power digital design. The